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**PROCEDURES FOR USE OF APPROACH AND  
LANDING PERFORMANCE TABLES**

1. Determine gross weight of airplane at the time of arrival at the destination airport.
2. Obtain airport information; i.e., active runway, available runway length, temperature, altitude, wind, icing conditions and runway gradient if applicable. Determine that the temperature is within the ambient temperature limits found in Section II, Limitations.
3. Determine wind component parallel to active runway from the crosswind component chart (Figure 4-13).
4. Check the maximum landing weight permitted by climb requirements and the brake energy limits (Figures 4-46, if anti-ice systems are OFF; Figures 4-45 and 4-46, if anti-ice systems are ON). If these limitations restrict the landing weight, the pilot must burn off fuel prior to landing.
5. **FOR LANDINGS ON DRY RUNWAYS:**  
Determine the landing distance,  $V_{APP}$  and  $V_{REF}$  from Figure 4-47 (flaps land), then apply the appropriate factors from the note below. If the available runway length is less than the landing distance required, the airplane landing weight must be reduced.

**NOTE**

- Multiply the FLAPS LAND landing distance by 1.20 for a -1 percent (downhill) runway gradient or by 1.80 for a -2 percent (downhill) runway gradient. For positive (uphill) runway gradients, use the landing distance obtained from Figure 4-47.
  - For inoperative antiskid system, multiply the landing distance obtained from Figure 4-47 by 1.4.
  - For attenuators stowed, use the landing distance obtained from Figure 4-47.
6. Determine the takeoff thrust setting from Figure 4-8 in the event that a go-around is necessary.
  7. The approach climb and landing climb gradient tables (Figures 4-48, 4-49, 4-50, and 4-51) are for advisory information only.

**NOTE**

- These procedures apply for normal landings at or below 11,500 pounds. Performance above 11,500 pounds is provided as additional information, for use in an emergency which requires a landing at a weight in excess of the maximum design landing weight of 11,500 pounds.
- For operation from wet, slush, snow and ice covered runways, refer to Section VII.

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Figure 4-44

# **MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS** **APPROACH FLAPS - 15° LANDING FLAPS - LAND**

The maximum allowable landing weight with anti-ice OFF and for brake energy limits is determined from Figure 4-46 for a given set of conditions. Figure 4-45 does not include data for brake energy limits, therefore, when determining maximum landing weight with anti-ice ON, determine the maximum weight from both Figure 4-45 and Figure 4-46, and use the lesser of the two weights.

## **EXAMPLE: Anti-Ice - ON**

Ambient Temperature = 5°C

Pressure Altitude = 8000 FEET

Wind = -10 KNOTS (TAILWIND)

Runway Gradient = -2% (DOWNHILL)

From Figure 4-45, Maximum Weight = 11,000 POUNDS

From Figure 4-46, Maximum Weight = 10,630 POUNDS

Therefore, Maximum Weight = 10,630 POUNDS

# **MAXIMUM LANDING WEIGHTS - POUND PERMITTED BY CLIMB REQUIREMENTS**

## **ANTI - ICE SYSTEMS - ON**

### **CONDITIONS:**

Landing Gear - UP

Speed Brakes - RETRACT

Wing Flaps - 15

ALTITUDE - FEET									
SL TO 5000		6000		7000		8000		9000	
TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT
-54 TO 10	11500	-54 TO 7	11500	-54 TO 4	11500	-54 TO 1	11500	-54 TO -5	11500
		10	11090	5	11430	5	11000	0	10840
				10	10690	10	10300	5	10130
								10	9490

ALTITUDE - FEET									
10000		11000		12000		13000		14000	
TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT	TEMP DEG. C	MAXIMUM LANDING WEIGHT
-54 TO -10	11500	-54 TO -13	11500	-54 TO -15	11500	-54 TO -18	11500	-54 TO -21	11500
-5	10640	-10	11080	-10	10660	-15	11090	-20	11400
0	9950	-5	10270	-5	9880	-10	10240	-15	10650
5	9300	0	9580	0	9220	-5	9480	-10	9840
10	8730	5	8960	5	8630	0	8850	-5	9120
		10	8390	10	8060	5	8290	0	8510
						10	7730	5	7950
								10	7440

 Figure 4-45



CONDITIONS: **LANDING GEAR - UP** **SPEEDBRAKES - RETRACT**  
**ANTI-ICE SYSTEMS - OFF** **THRUST ATTENUATORS - AUTO**

525AFM-04-00

 Figure 4-46 (Sheet 1 of 5)



CONDITIONS: LANDING GEAR - UP SPEEDBRAKES - RETRACT  
ANTI-ICE SYSTEMS - OFF THRUST ATTENUATORS - AUTO

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
5	-33	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-30	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-15	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-10	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-5	11420	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	0	11320	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	5	11220	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
10		11130	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
15		11040	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
20		10950	11410	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
25		10860	11320	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
30		10770	11230	11450	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
35		10690	11140	11360	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
40		10610	11050	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250	11250
44		10540	10850	10850	10850	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650



CONDITIONS: **LANDING GEAR - UP** **SPEEDBRAKES - RETRACT**  
**ANTI-ICE SYSTEMS - OFF** **THRUST ATTENUATORS - AUTO**

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RNWY GRADIENT PERCENT				RNWY GRADIENT PERCENT				RNWY GRADIENT PERCENT				RNWY GRADIENT PERCENT				RNWY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
0	-33	11390	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-30	11320	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-25	11210	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-20	11110	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-15	11010	11480	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
10	-10	10910	11380	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-5	10810	11270	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	0	10720	11170	11400	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	5	10630	11080	11300	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	10	10540	10980	11200	11420	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
20	15	10450	10890	11110	11320	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	20	10370	10800	11010	11230	11440	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	25	10280	10710	10920	11130	11340	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	30	10200	10620	10830	11040	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220	11220
	35	10120	10540	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590	10590
37	10080	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190	10190

 Figure 4-46 (Sheet 3)



# MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS APPROACH FLAPS - 15° LANDING FLAPS - LAND

CONDITIONS: LANDING GEAR - UP SPEEDBRAKES - RETRACT  
ANTI-ICE SYSTEMS - OFF THRUST ATTENUATORS - AUTO

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
9	-33	11180	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-30	11110	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	11010	11490	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	10910	11380	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-15	10810	11270	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-10	10710	11170	11390	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-5	10620	11070	11290	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	0	10520	10970	11190	11410	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	5	10430	10870	11090	11310	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
10	10	10340	10780	10990	11210	11420	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
15	15	10260	10690	10900	11110	11320	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
20	20	10180	10600	10810	11020	11220	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
25	25	10090	10510	10720	10930	11130	11320	11320	11320	11320	11320	11320	11320	11320	11320	11320	11320	11320	11320	11320	11320
30	30	10010	10430	10630	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790
35	35	9920	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040	10040

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
1	-33	10980	11450	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-30	10910	11390	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	10810	11270	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	10710	11170	11390	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-15	10610	11060	11290	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-10	10510	10960	11180	11400	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-5	10420	10860	11080	11300	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	0	10330	10760	10980	11190	11400	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	5	10240	10670	10880	11090	11300	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
10	10	10150	10580	10790	11000	11200	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
15	15	10070	10490	10700	10900	11100	11500	11500	11500	11500	11470	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
20	20	9990	10400	10610	10810	11000	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370
25	25	9910	10320	10520	10720	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890	10890
30	30	9830	10240	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360	10360
33	33	9770	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870	9870

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
1	-33	10770	11240	11470	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
1	-30	10710	11170	11400	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	10610	11060	11290	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	10510	10960	11180	11400	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-15	10410	10860	11070	11290	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-10	10320	10760	10970	11190	11390	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-5	10230	10660	10870	11080	11280	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	0	10140	10560	10770	10980	11180	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	5	10050	10470	10680	10890	11080	11500	11500	11500	11500	11440	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
10	10	9970	10380	10590	10790	10980	11420	11500	11500	11340	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
15	15	9880	10290	10500	10700	10880	11320	11370	11370	11240	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370	11370
20	20	9800	10210	10410	10610	10790	10930	10930	10930	10930	10930	10930	10930	10930	10930	10930	10930	10930	10930	10930	10930
25	25	9720	10120	10320	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480	10480
30	30	9650	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900	9900
31	31	9620	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700	9700



# **MAXIMUM LANDING WEIGHT PERMITTED BY CLIMB REQUIREMENTS OR BRAKE ENERGY LIMITS - POUNDS** **APPROACH FLAPS - 15° LANDING FLAPS - LAND**

CONDITIONS: LANDING GEAR - UP      SPEEDBRAKES - RETRACT  
ANTI-ICE SYSTEMS - OFF      THRUST ATTENUATORS - AUTO

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
1	-33	10570	11030	11250	11480	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
2	-30	10510	10960	11190	11410	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	10410	10860	11080	11300	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	10310	10750	10970	11190	11380	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-15	10220	10650	10870	11080	11270	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-10	10130	10550	10760	10980	11170	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-5	10040	10460	10670	10870	11060	11500	11500	11500	11430	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	0	9950	10360	10570	10780	10960	11400	11500	11500	11320	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	5	9860	10270	10480	10680	10860	11290	11500	11500	11210	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
10		9780	10190	10390	10590	10760	11190	11310	11310	11110	11310	11310	11310	11310	11310	11310	11310	11310	11310	11310	11310
15		9700	10100	10300	10500	10670	10920	10920	10920	10920	10920	10920	10920	10920	10920	10920	10920	10920	10920	10920	10920
20		9620	10020	10210	10410	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510	10510
25		9540	9930	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090	10090
29		9480	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530	9530

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
1	-33	10370	10820	11040	11260	11460	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
3	-30	10310	10760	10970	11190	11390	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	10220	10650	10870	11080	11270	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	10120	10550	10760	10970	11160	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-15	10030	10450	10660	10870	11050	11500	11500	11500	11420	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-10	9940	10350	10560	10770	10950	11390	11500	11500	11300	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	-5	9850	10260	10460	10670	10840	11280	11490	11500	11200	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
	0	9760	10170	10370	10570	10740	11170	11380	11500	11090	11500	11500	11500	11450	11500	11500	11500	11500	11500	11500	11500
	5	9680	10080	10280	10480	10640	11070	11230	11230	10990	11230	11230	11230	11230	11230	11230	11230	11230	11230	11230	11230
10		9600	9990	10190	10380	10550	10860	10860	10860	10860	10860	10860	10860	10860	10860	10860	10860	10860	10860	10860	10860
15		9520	9910	10100	10300	10460	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500
20		9440	9830	10020	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130	10130
25		9360	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630	9630
27		9330	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350	9350

ALT FT	TEMP DEG C	WIND - KNOTS																			
		-10				0				10				20				30			
		RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT				RWNY GRADIENT PERCENT			
		-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2	-2	0	1	2
1	-33	10180	10610	10830	11040	11230	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
4	-30	10120	10550	10760	10980	11160	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-25	10020	10450	10660	10870	11050	11500	11500	11500	11410	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-20	9930	10350	10560	10760	10940	11380	11500	11500	11300	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-15	9840	10250	10450	10660	10830	11270	11480	11500	11180	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500
0	-10	9750	10160	10360	10560	10730	11160	11370	11500	11080	11500	11500	11500	11440	11500	11500	11500	11500	11500	11500	11500
	-5	9660	10060	10260	10460	10630	11050	11260	11470	10970	11400	11500	11500	11320	11500	11500	11500	11500	11500	11500	11500
	0	9580	9970	10170	10370	10530	10950	11150	11150	10870	11150	11150	11150	11150	11150	11150	11150	11150	11150	11150	11150
	5	9490	9890	10080	10270	10430	10790	10790	10790	10770	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790	10790
10		9410	9800	9990	10180	10340	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450	10450
15		9340	9720	9910	10100	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110	10110
20		9260	9640	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780	9780
25		9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170	9170

025AFM-04-00




Figure 4-46 (Sheet 5)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

# FLAPS - LAND SEA LEVEL

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3440	2870	2700	2540	2380
-20	3470	2900	2730	2570	2410
-15	3510	2930	2770	2600	2440
-10	3540	2970	2800	2640	2480
-5	3580	3000	2830	2670	2510
0	3610	3030	2870	2700	2540
5	3650	3070	2900	2730	2570
10	3680	3100	2930	2770	2610
15	3720	3140	2970	2800	2640
20	3750	3170	3000	2830	2670
25	3790	3200	3030	2870	2700
30	3830	3240	3070	2900	2740
35	3860	3270	3100	2930	2770
40	3900	3310	3140	2970	2800
45	3940	3350	3170	3000	2840
48	3960	3370	3190	3020	2860

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3300	2740	2570	2410	2260
-20	3330	2770	2600	2440	2290
-15	3360	2800	2630	2470	2320
-10	3390	2830	2660	2500	2350
-5	3430	2860	2690	2530	2380
0	3460	2890	2720	2560	2410
5	3490	2920	2760	2590	2440
10	3530	2950	2790	2630	2470
15	3560	2980	2820	2660	2500
20	3590	3020	2850	2690	2530
25	3620	3050	2880	2720	2560
30	3660	3080	2910	2750	2590
35	3690	3110	2940	2780	2620
40	3730	3150	2980	2810	2650
45	3760	3180	3010	2840	2680
50	3800	3210	3040	2880	2710
55	3830	3250	3080	2910	2750

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3280	2720	2560	2400	2240
-20	3310	2750	2590	2430	2270
-15	3350	2780	2620	2460	2300
-10	3380	2810	2650	2490	2330
-5	3410	2840	2680	2520	2360
0	3440	2870	2710	2550	2390
5	3470	2900	2740	2580	2420
10	3510	2940	2770	2610	2450
15	3540	2970	2800	2640	2480
20	3570	3000	2830	2670	2510
25	3600	3030	2860	2700	2540
30	3640	3060	2890	2730	2570
35	3670	3090	2930	2760	2600
40	3710	3130	2960	2790	2630
45	3740	3160	2990	2830	2670
50	3780	3190	3020	2860	2700
55	3810	3230	3060	2890	2730

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3250	2690	2530	2370	2220
-20	3280	2720	2560	2400	2240
-15	3310	2750	2590	2430	2270
-10	3340	2780	2610	2460	2300
-5	3370	2810	2640	2490	2330
0	3410	2840	2670	2520	2360
5	3440	2870	2710	2550	2390
10	3470	2900	2740	2580	2420
15	3500	2930	2770	2610	2450
20	3530	2960	2800	2630	2480
25	3570	2990	2830	2670	2510
30	3600	3030	2860	2700	2540
35	3630	3060	2890	2730	2570
40	3670	3090	2920	2760	2600
45	3700	3120	2950	2790	2630
50	3730	3150	2990	2820	2660
55	3770	3190	3020	2850	2690

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3220	2660	2500	2340	2190
-20	3250	2690	2530	2370	2210
-15	3280	2720	2550	2400	2240
-10	3310	2750	2580	2420	2270
-5	3340	2780	2610	2450	2300
0	3370	2810	2640	2480	2330
5	3400	2840	2670	2510	2360
10	3430	2870	2700	2540	2390
15	3460	2900	2730	2570	2420
20	3500	2930	2760	2600	2440
25	3530	2960	2790	2630	2470
30	3560	2990	2820	2660	2500
35	3590	3020	2850	2690	2530
40	3630	3050	2880	2720	2560
45	3660	3080	2920	2750	2590
50	3690	3120	2950	2780	2620
55	3730	3150	2980	2810	2650

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3190	2630	2470	2310	2160
-20	3220	2660	2490	2340	2190
-15	3240	2680	2520	2370	2210
-10	3270	2710	2550	2390	2240
-5	3300	2740	2580	2420	2270
0	3330	2770	2610	2450	2300
5	3360	2800	2640	2480	2330
10	3400	2830	2670	2510	2350
15	3430	2860	2700	2540	2380
20	3460	2890	2730	2570	2410
25	3490	2920	2760	2600	2440
30	3520	2950	2790	2630	2470
35	3550	2980	2820	2660	2500
40	3590	3010	2850	2690	2530
45	3620	3050	2880	2720	2560
50	3650	3080	2910	2750	2590
55	3680	3110	2940	2780	2620

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 1 of 30)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
SEA LEVELCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS		VAPP = 113 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3140	2580	2420	2270	2110
-20	3170	2610	2450	2290	2140
-15	3190	2640	2480	2320	2170
-10	3220	2660	2500	2350	2200
-5	3250	2690	2530	2370	2220
0	3280	2720	2560	2400	2250
5	3310	2750	2590	2430	2280
10	3340	2780	2620	2460	2310
15	3370	2810	2650	2490	2330
20	3400	2840	2670	2510	2360
25	3430	2870	2700	2540	2390
30	3460	2900	2730	2570	2420
35	3490	2930	2760	2600	2450
40	3520	2960	2790	2630	2470
45	3560	2990	2820	2660	2500
50	3590	3020	2850	2690	2530
55	3620	3050	2880	2720	2560

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS		VAPP = 110 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3060	2500	2350	2190	2040
-20	3080	2530	2370	2220	2070
-15	3110	2560	2400	2240	2090
-10	3130	2580	2420	2270	2120
-5	3160	2610	2450	2290	2140
0	3190	2640	2480	2320	2170
5	3220	2660	2500	2350	2200
10	3250	2690	2530	2370	2220
15	3270	2720	2560	2400	2250
20	3300	2750	2580	2430	2280
25	3330	2770	2610	2450	2300
30	3360	2800	2640	2480	2330
35	3390	2830	2670	2510	2360
40	3420	2860	2700	2540	2380
45	3450	2890	2730	2570	2410
50	3480	2920	2750	2590	2440
55	3510	2950	2780	2620	2470

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS		VAPP = 108 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2970	2430	2270	2120	1970
-20	3000	2450	2290	2140	1990
-15	3020	2470	2320	2160	2020
-10	3050	2500	2340	2190	2040
-5	3070	2520	2370	2210	2060
0	3100	2550	2390	2240	2090
5	3120	2580	2420	2260	2110
10	3150	2600	2440	2290	2140
15	3180	2630	2470	2310	2160
20	3200	2650	2490	2340	2190
25	3230	2680	2520	2370	2220
30	3260	2710	2550	2390	2240
35	3290	2730	2570	2420	2270
40	3320	2760	2600	2440	2290
45	3350	2790	2630	2470	2320
50	3370	2820	2660	2500	2350
55	3400	2850	2680	2530	2370

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS		VAPP = 105 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2890	2350	2190	2040	1890
-20	2910	2370	2210	2060	1920
-15	2930	2390	2240	2080	1940
-10	2960	2410	2260	2110	1960
-5	2980	2440	2280	2130	1980
0	3000	2460	2310	2150	2010
5	3030	2490	2330	2180	2030
10	3050	2510	2350	2200	2050
15	3080	2530	2380	2230	2080
20	3100	2560	2400	2250	2100
25	3130	2580	2430	2270	2130
30	3160	2610	2450	2300	2150
35	3180	2630	2480	2320	2170
40	3210	2660	2500	2350	2200
45	3240	2690	2530	2370	2220
50	3260	2710	2550	2400	2250
55	3290	2740	2580	2430	2270

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS		VAPP = 102 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2800	2260	2110	1960	1820
-20	2820	2280	2130	1980	1840
-15	2840	2300	2150	2000	1860
-10	2860	2330	2170	2020	1880
-5	2880	2350	2190	2040	1900
0	2910	2370	2220	2070	1920
5	2930	2390	2240	2090	1940
10	2950	2420	2260	2110	1970
15	2980	2440	2280	2130	1990
20	3000	2460	2310	2160	2010
25	3020	2480	2330	2180	2030
30	3050	2510	2350	2200	2060
35	3070	2530	2380	2230	2080
40	3100	2560	2400	2250	2100
45	3120	2580	2430	2270	2130
50	3150	2610	2450	2300	2150
55	3180	2630	2470	2320	2170

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS		VAPP = 98 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2700	2170	2010	1870	1720
-20	2710	2180	2030	1880	1740
-15	2730	2200	2050	1900	1760
-10	2750	2220	2070	1920	1780
-5	2770	2240	2090	1940	1800
0	2790	2260	2110	1960	1820
5	2810	2280	2130	1980	1840
10	2830	2300	2150	2010	1860
15	2850	2330	2170	2030	1880
20	2880	2350	2190	2050	1900
25	2900	2370	2220	2070	1930
30	2920	2390	2240	2090	1950
35	2940	2410	2260	2110	1970
40	2970	2440	2280	2130	1990
45	2990	2460	2310	2160	2010
50	3020	2480	2330	2180	2030
55	3040	2510	2350	2200	2060

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 2)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

# FLAPS - LAND 1000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS VREF = 115 KIAS VAPP = 122 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-25	3520	2940	2770	2610	2450
-20	3550	2970	2800	2640	2480
-15	3590	3010	2840	2670	2510
-10	3620	3040	2870	2710	2550
-5	3660	3080	2910	2740	2580
0	3700	3110	2940	2780	2610
5	3730	3150	2980	2810	2650
10	3770	3180	3010	2850	2680
15	3810	3220	3050	2880	2720
20	3840	3250	3080	2910	2750
25	3880	3290	3120	2950	2780
30	3920	3330	3150	2980	2820
35	3960	3360	3190	3020	2850
40	4000	3400	3220	3050	2890
45	4030	3440	3260	3090	2920

WEIGHT = 11500 POUNDS VREF = 111 KIAS VAPP = 118 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-25	3370	2800	2640	2480	2320
-20	3400	2830	2670	2510	2350
-15	3440	2870	2700	2540	2380
-10	3470	2900	2730	2570	2410
-5	3500	2930	2760	2600	2440
0	3540	2960	2800	2630	2480
5	3570	3000	2830	2670	2510
10	3610	3030	2860	2700	2540
15	3640	3060	2890	2730	2570
20	3670	3100	2930	2760	2600
25	3710	3130	2960	2790	2630
30	3740	3160	2990	2830	2670
35	3780	3200	3030	2860	2700
40	3820	3230	3060	2890	2730
45	3850	3260	3090	2930	2760
50	3890	3300	3130	2960	2790

WEIGHT = 11400 POUNDS VREF = 111 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-25	3360	2790	2620	2460	2310
-20	3390	2820	2650	2490	2340
-15	3420	2850	2680	2520	2370
-10	3450	2880	2720	2550	2400
-5	3490	2910	2750	2590	2430
0	3520	2950	2780	2620	2460
5	3550	2980	2810	2650	2490
10	3590	3010	2840	2680	2520
15	3620	3040	2880	2710	2550
20	3650	3080	2910	2740	2580
25	3690	3110	2940	2780	2620
30	3720	3140	2970	2810	2650
35	3760	3180	3010	2840	2680
40	3800	3210	3040	2870	2710
45	3830	3240	3070	2910	2740
50	3870	3280	3110	2940	2780
51	3870	3290	3110	2950	2780

WEIGHT = 11200 POUNDS VREF = 110 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-25	3320	2760	2590	2430	2280
-20	3350	2790	2620	2460	2310
-15	3390	2820	2650	2490	2340
-10	3420	2850	2680	2520	2370
-5	3450	2880	2710	2550	2400
0	3480	2910	2750	2580	2430
5	3520	2940	2780	2620	2460
10	3550	2980	2810	2650	2490
15	3580	3010	2840	2680	2520
20	3620	3040	2870	2710	2550
25	3650	3070	2900	2740	2580
30	3680	3110	2940	2770	2610
35	3720	3140	2970	2800	2640
40	3750	3170	3000	2840	2680
45	3790	3210	3030	2870	2710
50	3820	3240	3070	2900	2740
52	3840	3260	3090	2920	2760

WEIGHT = 11000 POUNDS VREF = 109 KIAS VAPP = 115 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-25	3290	2720	2560	2400	2250
-20	3320	2750	2590	2430	2280
-15	3350	2780	2620	2460	2310
-10	3380	2810	2650	2490	2340
-5	3410	2850	2680	2520	2370
0	3450	2880	2710	2550	2400
5	3480	2910	2740	2580	2430
10	3510	2940	2770	2610	2460
15	3540	2970	2810	2640	2490
20	3580	3000	2840	2670	2520
25	3610	3040	2870	2700	2550
30	3640	3070	2900	2740	2580
35	3680	3100	2930	2770	2610
40	3710	3130	2960	2800	2640
45	3750	3170	3000	2830	2670
50	3780	3200	3030	2860	2700
52	3800	3220	3050	2880	2720

WEIGHT = 10800 POUNDS VREF = 108 KIAS VAPP = 114 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-25	3260	2690	2530	2370	2220
-20	3280	2720	2560	2400	2250
-15	3320	2750	2590	2430	2280
-10	3350	2780	2620	2460	2300
-5	3380	2810	2650	2490	2330
0	3410	2840	2680	2520	2360
5	3440	2870	2710	2550	2390
10	3470	2900	2740	2580	2420
15	3510	2940	2770	2610	2450
20	3540	2970	2800	2640	2480
25	3570	3000	2830	2670	2510
30	3600	3030	2860	2700	2540
35	3640	3060	2890	2730	2570
40	3670	3090	2930	2760	2600
45	3700	3130	2960	2790	2630
50	3740	3160	2990	2820	2660
52	3760	3180	3010	2840	2680

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A HEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 3)



# MODEL 525A

## SECTION IV - PERFORMANCE APPROACH AND LANDING

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
1000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3200	2640	2480	2330	2170
-20	3230	2670	2510	2350	2200
-15	3260	2700	2540	2380	2230
-10	3290	2730	2570	2410	2260
-5	3320	2760	2600	2440	2290
0	3350	2790	2630	2470	2310
5	3380	2820	2660	2500	2340
10	3420	2850	2690	2530	2370
15	3450	2880	2720	2560	2400
20	3480	2910	2750	2580	2430
25	3510	2940	2780	2610	2460
30	3540	2970	2810	2640	2490
35	3570	3000	2840	2670	2520
40	3610	3030	2870	2700	2550
45	3640	3070	2900	2730	2580
50	3670	3100	2930	2770	2610
52	3690	3120	2950	2780	2620

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3120	2560	2400	2250	2100
-20	3150	2590	2430	2270	2120
-15	3170	2620	2460	2300	2150
-10	3200	2650	2490	2330	2180
-5	3230	2670	2510	2360	2200
0	3260	2700	2540	2380	2230
5	3290	2730	2570	2410	2260
10	3320	2760	2600	2440	2290
15	3350	2790	2630	2470	2310
20	3380	2820	2650	2490	2340
25	3410	2850	2680	2520	2370
30	3440	2870	2710	2550	2400
35	3470	2900	2740	2580	2430
40	3500	2930	2770	2610	2450
45	3530	2960	2800	2640	2480
50	3560	2990	2830	2670	2510
52	3580	3010	2850	2680	2530

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3030	2480	2330	2170	2020
-20	3060	2510	2350	2200	2050
-15	3090	2530	2380	2220	2070
-10	3110	2560	2400	2250	2100
-5	3140	2590	2430	2270	2120
0	3170	2610	2450	2300	2150
5	3190	2640	2480	2330	2170
10	3220	2670	2510	2350	2200
15	3250	2690	2530	2380	2230
20	3280	2720	2560	2400	2250
25	3300	2750	2590	2430	2280
30	3330	2780	2620	2460	2310
35	3360	2800	2640	2490	2330
40	3390	2830	2670	2510	2360
45	3420	2860	2700	2540	2390
50	3450	2890	2730	2570	2410
52	3470	2910	2740	2580	2430

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2950	2400	2240	2090	1940
-20	2970	2420	2270	2110	1970
-15	2990	2450	2290	2140	1990
-10	3020	2470	2310	2160	2020
-5	3040	2500	2340	2190	2040
0	3070	2520	2360	2210	2060
5	3090	2550	2390	2240	2090
10	3120	2570	2410	2260	2110
15	3150	2600	2440	2290	2140
20	3170	2620	2460	2310	2160
25	3200	2650	2490	2340	2190
30	3230	2680	2520	2360	2210
35	3250	2700	2540	2390	2240
40	3280	2730	2570	2410	2260
45	3310	2760	2600	2440	2290
50	3340	2780	2620	2470	2310
52	3360	2800	2640	2480	2330

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2860	2310	2160	2010	1860
-20	2880	2340	2180	2030	1880
-15	2900	2360	2200	2050	1910
-10	2920	2380	2230	2080	1930
-5	2940	2400	2250	2100	1950
0	2970	2430	2270	2120	1980
5	2990	2450	2300	2140	2000
10	3020	2470	2320	2170	2020
15	3040	2500	2340	2190	2040
20	3060	2520	2370	2210	2070
25	3090	2550	2390	2240	2090
30	3110	2570	2410	2260	2110
35	3140	2600	2440	2290	2140
40	3170	2620	2460	2310	2160
45	3190	2650	2490	2340	2190
50	3220	2670	2520	2360	2210
52	3240	2690	2530	2380	2230

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2750	2210	2060	1910	1770
-20	2770	2230	2080	1930	1790
-15	2790	2250	2100	1950	1810
-10	2810	2270	2120	1970	1830
-5	2830	2290	2140	1990	1850
0	2850	2320	2160	2020	1870
5	2870	2340	2190	2040	1890
10	2890	2360	2210	2060	1920
15	2920	2380	2230	2080	1940
20	2940	2400	2250	2100	1960
25	2960	2430	2270	2120	1980
30	2980	2450	2300	2150	2000
35	3010	2470	2320	2170	2020
40	3030	2500	2340	2190	2050
45	3060	2520	2370	2220	2070
50	3080	2540	2390	2240	2090
52	3100	2560	2400	2250	2110

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 4)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

## FLAPS - LAND 2000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS VREF = 115 KIAS VAPP = 122 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3560	2980	2810	2640	2480
-25	3600	3010	2840	2680	2520
-20	3630	3050	2880	2710	2550
-15	3670	3080	2910	2750	2590
-10	3710	3120	2950	2780	2620
-5	3740	3160	2990	2820	2660
0	3780	3190	3020	2850	2690
5	3820	3230	3060	2890	2730
10	3860	3270	3090	2930	2760
15	3900	3300	3130	2960	2800
20	3940	3340	3170	3000	2830
25	3980	3380	3200	3030	2870
30	4010	3420	3240	3070	2900
35	4050	3450	3280	3110	2940
40	4090	3490	3310	3140	2970
42	4110	3510	3330	3160	2990

WEIGHT = 11500 POUNDS VREF = 111 KIAS VAPP = 118 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3410	2840	2670	2510	2360
-25	3450	2870	2710	2540	2390
-20	3480	2910	2740	2580	2420
-15	3510	2940	2770	2610	2450
-10	3550	2970	2800	2640	2480
-5	3580	3010	2840	2670	2510
0	3620	3040	2870	2710	2550
5	3650	3070	2900	2740	2580
10	3690	3110	2940	2770	2610
15	3730	3140	2970	2810	2650
20	3760	3180	3010	2840	2680
25	3800	3210	3040	2870	2710
30	3830	3250	3070	2910	2740
35	3870	3280	3110	2940	2780
40	3910	3320	3140	2980	2810
45	3950	3350	3180	3010	2840
47	3960	3370	3190	3020	2860

WEIGHT = 11400 POUNDS VREF = 111 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3400	2820	2660	2500	2340
-25	3430	2860	2690	2530	2370
-20	3460	2890	2720	2560	2400
-15	3500	2920	2750	2590	2430
-10	3530	2950	2790	2620	2470
-5	3560	2990	2820	2660	2500
0	3600	3020	2850	2690	2530
5	3640	3060	2890	2720	2560
10	3670	3090	2920	2760	2600
15	3710	3120	2950	2790	2630
20	3740	3160	2990	2820	2660
25	3780	3190	3020	2860	2690
30	3810	3230	3060	2890	2730
35	3850	3260	3090	2920	2760
40	3890	3300	3120	2960	2790
45	3920	3330	3160	2990	2830
48	3950	3350	3180	3010	2850

WEIGHT = 11200 POUNDS VREF = 110 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3360	2790	2630	2470	2310
-25	3400	2820	2660	2500	2340
-20	3430	2860	2690	2530	2370
-15	3460	2890	2720	2560	2400
-10	3490	2920	2750	2590	2430
-5	3530	2950	2790	2620	2470
0	3560	2990	2820	2660	2500
5	3600	3020	2850	2690	2530
10	3630	3050	2890	2720	2560
15	3670	3090	2920	2750	2590
20	3700	3120	2950	2790	2620
25	3740	3150	2980	2820	2660
30	3770	3190	3020	2850	2690
35	3810	3220	3050	2880	2720
40	3840	3260	3080	2920	2750
45	3880	3290	3120	2950	2790
49	3910	3320	3150	2980	2810

WEIGHT = 11000 POUNDS VREF = 109 KIAS VAPP = 115 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-25	3360	2790	2630	2470	2310
-20	3390	2820	2660	2500	2340
-15	3420	2850	2690	2530	2370
-10	3460	2890	2720	2560	2400
-5	3490	2920	2750	2590	2430
0	3520	2950	2780	2620	2460
5	3560	2980	2820	2650	2500
10	3590	3020	2850	2690	2530
15	3630	3050	2880	2720	2560
20	3660	3080	2910	2750	2590
25	3700	3120	2950	2780	2620
30	3730	3150	2980	2810	2650
35	3770	3180	3010	2850	2680
40	3800	3220	3050	2880	2720
45	3840	3250	3080	2910	2750
50	3870	3280	3110	2940	2780

WEIGHT = 10800 POUNDS VREF = 108 KIAS VAPP = 114 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-25	3330	2760	2590	2430	2280
-20	3360	2790	2620	2460	2310
-15	3390	2820	2660	2500	2340
-10	3420	2850	2690	2530	2370
-5	3450	2880	2720	2560	2400
0	3490	2910	2750	2590	2430
5	3520	2950	2780	2620	2460
10	3550	2980	2810	2650	2490
15	3590	3010	2840	2680	2520
20	3620	3040	2880	2710	2550
25	3650	3080	2910	2740	2580
30	3690	3110	2940	2780	2620
35	3720	3140	2970	2810	2650
40	3760	3180	3010	2840	2680
45	3790	3210	3040	2870	2710
50	3830	3240	3070	2900	2740

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 5)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
2000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE HEIGHT FROM MAXIMUM LANDING HEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS			VAPP = 113 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3270	2710	2550	2390	2230
-20	3300	2740	2580	2420	2260
-15	3330	2770	2610	2450	2290
-10	3360	2800	2630	2480	2320
-5	3400	2830	2670	2510	2350
0	3430	2860	2700	2540	2380
5	3460	2890	2730	2570	2410
10	3490	2920	2760	2600	2440
15	3530	2950	2790	2630	2470
20	3560	2990	2820	2660	2500
25	3590	3020	2850	2690	2530
30	3620	3050	2880	2720	2560
35	3660	3080	2910	2750	2590
40	3690	3110	2950	2780	2620
45	3730	3150	2980	2810	2650
50	3760	3180	3010	2840	2680

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS			VAPP = 110 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3190	2630	2470	2310	2160
-20	3210	2650	2490	2340	2180
-15	3240	2680	2520	2360	2210
-10	3270	2710	2550	2390	2240
-5	3300	2740	2580	2420	2270
0	3330	2770	2610	2450	2290
5	3360	2800	2640	2480	2320
10	3390	2830	2670	2510	2350
15	3420	2860	2700	2540	2380
20	3450	2890	2720	2560	2410
25	3490	2920	2750	2590	2440
30	3520	2950	2780	2620	2470
35	3550	2980	2810	2650	2500
40	3580	3010	2850	2680	2530
45	3620	3040	2880	2710	2550
50	3650	3070	2910	2740	2580

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS			VAPP = 108 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3100	2540	2380	2230	2080
-20	3120	2570	2410	2250	2100
-15	3150	2600	2440	2280	2130
-10	3180	2620	2460	2310	2160
-5	3210	2650	2490	2330	2180
0	3230	2680	2520	2360	2210
5	3260	2710	2550	2390	2240
10	3290	2740	2570	2420	2260
15	3320	2760	2600	2440	2290
20	3350	2790	2630	2470	2320
25	3380	2820	2660	2500	2350
30	3410	2850	2690	2530	2370
35	3440	2880	2710	2560	2400
40	3470	2910	2740	2580	2430
45	3500	2940	2770	2610	2460
50	3530	2970	2800	2640	2480

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS			VAPP = 105 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	3010	2460	2300	2150	2000
-20	3030	2480	2320	2170	2020
-15	3060	2510	2350	2200	2050
-10	3080	2530	2370	2220	2070
-5	3110	2560	2400	2250	2100
0	3130	2580	2420	2270	2120
5	3160	2610	2450	2300	2150
10	3190	2640	2480	2320	2170
15	3220	2660	2500	2350	2200
20	3240	2690	2530	2370	2220
25	3270	2720	2560	2400	2250
30	3300	2740	2580	2430	2280
35	3330	2770	2610	2450	2300
40	3360	2800	2640	2480	2330
45	3390	2830	2670	2510	2360
50	3420	2860	2690	2540	2380

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS			VAPP = 102 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2910	2370	2210	2060	1910
-20	2930	2390	2230	2080	1940
-15	2960	2410	2260	2110	1960
-10	2980	2440	2280	2130	1980
-5	3010	2460	2310	2150	2010
0	3030	2490	2330	2180	2030
5	3060	2510	2350	2200	2050
10	3080	2540	2380	2230	2080
15	3110	2560	2400	2250	2100
20	3130	2590	2430	2280	2130
25	3160	2610	2450	2300	2150
30	3180	2640	2480	2320	2180
35	3210	2660	2500	2350	2200
40	3240	2690	2530	2380	2230
45	3270	2720	2560	2400	2250
50	3290	2740	2580	2430	2280

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS			VAPP = 98 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-25	2800	2260	2110	1960	1820
-20	2820	2280	2130	1980	1840
-15	2840	2310	2150	2000	1860
-10	2860	2330	2170	2020	1880
-5	2890	2350	2200	2050	1900
0	2910	2370	2220	2070	1920
5	2930	2400	2240	2090	1950
10	2960	2420	2260	2110	1970
15	2980	2440	2290	2140	1990
20	3000	2460	2310	2160	2010
25	3030	2490	2330	2180	2040
30	3050	2510	2360	2210	2060
35	3080	2540	2380	2230	2080
40	3100	2560	2400	2250	2110
45	3130	2590	2430	2280	2130
50	3150	2610	2450	2300	2150

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 6)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

# FLAPS - LAND 3000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	3600	3020	2850	2680	2520
-30	3640	3050	2880	2720	2560
-25	3680	3090	2920	2750	2590
-20	3720	3130	2960	2790	2630
-15	3750	3170	2990	2830	2660
-10	3790	3200	3030	2860	2700
-5	3830	3240	3070	2900	2730
0	3870	3280	3100	2930	2770
5	3910	3320	3140	2970	2810
10	3950	3360	3180	3010	2840
15	3990	3390	3220	3050	2880
20	4030	3430	3250	3080	2920
25	4070	3470	3290	3120	2950
30	4110	3510	3330	3160	2990
35	4150	3550	3370	3200	3030
39	4190	3580	3400	3230	3060

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	3460	2880	2710	2550	2390
-30	3490	2910	2740	2580	2420
-25	3520	2950	2780	2610	2450
-20	3560	2980	2810	2650	2490
-15	3590	3010	2850	2680	2520
-10	3630	3050	2880	2710	2550
-5	3670	3080	2910	2750	2590
0	3700	3120	2950	2780	2620
5	3740	3160	2980	2820	2660
10	3780	3190	3020	2850	2690
15	3820	3230	3050	2890	2720
20	3850	3260	3090	2920	2760
25	3890	3300	3120	2960	2790
30	3930	3330	3160	2990	2830
35	3970	3370	3200	3030	2860
40	4000	3410	3230	3060	2890
44	4040	3440	3260	3090	2920

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-30	3470	2900	2730	2570	2410
-25	3510	2930	2760	2600	2440
-20	3540	2960	2790	2630	2470
-15	3580	3000	2830	2660	2500
-10	3610	3030	2860	2700	2540
-5	3650	3070	2900	2730	2570
0	3680	3100	2930	2770	2600
5	3720	3140	2970	2800	2640
10	3760	3170	3000	2830	2670
15	3790	3210	3040	2870	2710
20	3830	3240	3070	2900	2740
25	3870	3280	3110	2940	2770
30	3910	3310	3140	2970	2810
35	3940	3350	3180	3010	2840
40	3980	3390	3210	3040	2880
45	4020	3420	3250	3080	2910

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-30	3440	2860	2700	2530	2380
-25	3470	2890	2730	2570	2410
-20	3500	2930	2760	2600	2440
-15	3540	2960	2790	2630	2470
-10	3570	3000	2830	2660	2500
-5	3610	3030	2860	2700	2540
0	3650	3060	2900	2730	2570
5	3680	3100	2930	2760	2600
10	3720	3130	2960	2800	2640
15	3750	3170	3000	2830	2670
20	3790	3200	3030	2860	2700
25	3830	3240	3070	2900	2740
30	3860	3270	3100	2930	2770
35	3900	3310	3140	2970	2800
40	3940	3350	3170	3000	2840
45	3980	3380	3210	3040	2870
46	3980	3390	3210	3040	2880

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-30	3400	2830	2660	2500	2350
-25	3430	2860	2690	2530	2380
-20	3470	2890	2730	2570	2410
-15	3500	2930	2760	2600	2440
-10	3540	2960	2790	2630	2470
-5	3570	2990	2830	2660	2500
0	3610	3030	2860	2700	2540
5	3640	3060	2890	2730	2570
10	3680	3100	2930	2760	2600
15	3710	3130	2960	2790	2630
20	3750	3160	2990	2830	2670
25	3780	3200	3030	2860	2700
30	3820	3230	3060	2890	2730
35	3860	3270	3100	2930	2760
40	3890	3300	3130	2960	2800
45	3930	3340	3160	3000	2830
48	3960	3360	3190	3020	2860

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-30	3370	2800	2630	2470	2310
-25	3400	2830	2660	2500	2340
-20	3430	2860	2690	2530	2380
-15	3460	2890	2730	2560	2410
-10	3500	2920	2760	2600	2440
-5	3530	2960	2790	2630	2470
0	3570	2990	2820	2660	2500
5	3600	3020	2860	2690	2530
10	3640	3060	2890	2730	2570
15	3670	3090	2920	2760	2600
20	3710	3120	2950	2790	2630
25	3740	3160	2990	2820	2660
30	3780	3190	3020	2850	2690
35	3810	3230	3060	2890	2730
40	3850	3260	3090	2920	2760
45	3890	3300	3120	2960	2790
48	3910	3320	3150	2980	2820

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 7)



# MODEL 525A

## SECTION IV - PERFORMANCE APPROACH AND LANDING

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
3000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3310	2750	2580	2420	2270
-25	3340	2780	2610	2450	2300
-20	3380	2810	2640	2480	2330
-15	3410	2840	2670	2510	2360
-10	3440	2870	2700	2540	2390
-5	3470	2900	2740	2580	2420
0	3510	2930	2770	2610	2450
5	3540	2970	2800	2640	2480
10	3580	3000	2830	2670	2510
15	3610	3030	2860	2700	2540
20	3640	3060	2900	2730	2570
25	3680	3100	2930	2760	2600
30	3710	3130	2960	2800	2640
35	3750	3160	2990	2830	2670
40	3780	3200	3030	2860	2700
45	3820	3230	3060	2890	2730
48	3840	3260	3080	2920	2750

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3230	2660	2500	2340	2190
-25	3250	2690	2530	2370	2220
-20	3280	2720	2560	2400	2250
-15	3310	2750	2590	2430	2270
-10	3340	2780	2620	2460	2300
-5	3380	2810	2650	2490	2330
0	3410	2840	2680	2520	2360
5	3440	2870	2710	2550	2390
10	3470	2900	2740	2580	2420
15	3500	2930	2770	2610	2450
20	3540	2960	2800	2640	2480
25	3570	3000	2830	2670	2510
30	3600	3030	2860	2700	2540
35	3630	3060	2890	2730	2570
40	3670	3090	2920	2760	2600
45	3700	3120	2960	2790	2630
48	3730	3150	2980	2810	2650

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3140	2580	2420	2260	2110
-25	3160	2600	2440	2290	2140
-20	3190	2630	2470	2310	2160
-15	3220	2660	2500	2340	2190
-10	3250	2690	2530	2370	2220
-5	3280	2720	2560	2400	2250
0	3310	2750	2580	2430	2270
5	3340	2780	2610	2460	2300
10	3370	2810	2640	2480	2330
15	3400	2830	2670	2510	2360
20	3430	2860	2700	2540	2390
25	3460	2890	2730	2570	2410
30	3490	2920	2760	2600	2440
35	3520	2950	2790	2630	2470
40	3550	2980	2820	2660	2500
45	3590	3020	2850	2690	2530
48	3610	3040	2870	2710	2550

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	3040	2490	2330	2180	2030
-25	3070	2520	2360	2200	2050
-20	3090	2540	2380	2230	2080
-15	3120	2570	2410	2250	2100
-10	3150	2590	2430	2280	2130
-5	3180	2620	2460	2310	2160
0	3200	2650	2490	2330	2180
5	3230	2680	2520	2360	2210
10	3260	2700	2540	2390	2240
15	3290	2730	2570	2410	2260
20	3320	2760	2600	2440	2290
25	3350	2790	2630	2470	2320
30	3380	2820	2650	2500	2340
35	3410	2850	2680	2520	2370
40	3440	2870	2710	2550	2400
45	3470	2900	2740	2580	2430
48	3490	2920	2760	2600	2450

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	2950	2400	2240	2090	1940
-25	2970	2420	2270	2110	1970
-20	3000	2450	2290	2140	1990
-15	3020	2470	2320	2160	2010
-10	3040	2500	2340	2190	2040
-5	3070	2520	2360	2210	2060
0	3100	2550	2390	2240	2090
5	3120	2570	2420	2260	2110
10	3150	2600	2440	2290	2140
15	3180	2630	2470	2310	2160
20	3200	2650	2490	2340	2190
25	3230	2680	2520	2360	2210
30	3260	2700	2540	2390	2240
35	3290	2730	2570	2420	2270
40	3310	2760	2600	2440	2290
45	3340	2790	2630	2470	2320
48	3360	2810	2650	2490	2340

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-30	2840	2300	2140	1990	1850
-25	2860	2320	2160	2010	1870
-20	2880	2340	2180	2030	1890
-15	2900	2360	2210	2060	1910
-10	2920	2380	2230	2080	1930
-5	2950	2410	2250	2100	1960
0	2970	2430	2280	2120	1980
5	2990	2450	2300	2150	2000
10	3020	2480	2320	2170	2030
15	3040	2500	2350	2200	2050
20	3070	2530	2370	2220	2070
25	3090	2550	2390	2240	2100
30	3120	2580	2420	2270	2120
35	3150	2600	2440	2290	2140
40	3170	2630	2470	2320	2170
45	3200	2650	2490	2340	2190
48	3220	2670	2510	2360	2210

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 8)



# LANDING DISTANCE - FEET

# FLAPS - LAND 4000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3690	3100	2920	2760	2590
-30	3720	3130	2960	2790	2630
-25	3760	3170	3000	2830	2670
-20	3800	3210	3040	2870	2700
-15	3840	3250	3070	2900	2740
-10	3880	3290	3110	2940	2780
-5	3920	3330	3150	2980	2810
0	3970	3370	3190	3020	2850
5	4010	3410	3230	3060	2890
10	4050	3450	3270	3100	2930
15	4090	3490	3310	3130	2970
20	4130	3520	3350	3170	3000
25	4170	3560	3390	3210	3040
30	4220	3600	3430	3250	3080
35	4260	3650	3470	3290	3120
36	4270	3650	3470	3300	3130

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3530	2950	2780	2620	2460
-30	3570	2990	2820	2650	2490
-25	3600	3020	2850	2690	2530
-20	3640	3060	2890	2720	2560
-15	3680	3090	2920	2760	2590
-10	3720	3130	2960	2790	2630
-5	3750	3170	2990	2830	2660
0	3790	3200	3030	2860	2700
5	3830	3240	3070	2900	2730
10	3870	3280	3100	2930	2770
15	3910	3310	3140	2970	2800
20	3950	3350	3180	3010	2840
25	3980	3390	3210	3040	2870
30	4020	3420	3250	3080	2910
35	4060	3460	3290	3110	2950
40	4100	3500	3320	3150	2980
41	4110	3510	3330	3160	2990

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3520	2940	2770	2600	2440
-30	3550	2970	2800	2640	2480
-25	3590	3000	2830	2670	2510
-20	3620	3040	2870	2700	2540
-15	3660	3070	2900	2740	2580
-10	3700	3110	2940	2770	2610
-5	3730	3150	2980	2810	2650
0	3770	3180	3010	2840	2680
5	3810	3220	3050	2880	2720
10	3850	3260	3080	2920	2750
15	3890	3290	3120	2950	2790
20	3920	3330	3160	2990	2820
25	3960	3370	3190	3020	2860
30	4000	3400	3230	3060	2890
35	4040	3440	3270	3090	2930
40	4080	3480	3300	3130	2960
42	4100	3490	3320	3140	2980

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3480	2900	2730	2570	2410
-30	3510	2940	2770	2600	2440
-25	3550	2970	2800	2640	2480
-20	3580	3000	2830	2670	2510
-15	3620	3040	2870	2700	2540
-10	3660	3070	2900	2740	2580
-5	3690	3110	2940	2770	2610
0	3730	3150	2970	2810	2650
5	3770	3180	3010	2840	2680
10	3810	3220	3050	2880	2710
15	3840	3250	3080	2910	2750
20	3880	3290	3120	2950	2780
25	3920	3330	3150	2980	2820
30	3960	3360	3190	3020	2850
35	4000	3400	3220	3050	2890
40	4030	3440	3260	3090	2920
43	4060	3460	3280	3110	2940

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-30	3480	2900	2730	2570	2410
-25	3510	2930	2770	2600	2440
-20	3550	2970	2800	2640	2480
-15	3580	3000	2830	2670	2510
-10	3620	3040	2870	2700	2540
-5	3650	3070	2900	2740	2580
0	3690	3110	2940	2770	2610
5	3730	3140	2970	2810	2640
10	3760	3180	3010	2840	2680
15	3800	3210	3040	2870	2710
20	3840	3250	3080	2910	2750
25	3880	3280	3110	2940	2780
30	3910	3320	3150	2980	2810
35	3950	3360	3180	3010	2850
40	3990	3390	3220	3050	2880
45	4030	3430	3250	3080	2920

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-30	3440	2870	2700	2540	2380
-25	3480	2900	2730	2570	2410
-20	3510	2930	2770	2600	2440
-15	3540	2970	2800	2630	2480
-10	3580	3000	2830	2670	2510
-5	3610	3030	2870	2700	2540
0	3650	3070	2900	2730	2570
5	3690	3100	2930	2770	2610
10	3720	3140	2970	2800	2640
15	3760	3170	3000	2840	2670
20	3790	3210	3040	2870	2710
25	3830	3240	3070	2900	2740
30	3870	3280	3110	2940	2770
35	3910	3310	3140	2970	2810
40	3940	3350	3180	3010	2840
45	3980	3390	3210	3040	2880
46	3990	3400	3220	3050	2890

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 9)



## LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
4000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS			VAPP = 113 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-30	3390	2820	2650	2490	2330
-25	3420	2850	2680	2520	2360
-20	3450	2880	2710	2550	2390
-15	3490	2910	2740	2580	2420
-10	3520	2940	2780	2610	2460
-5	3550	2980	2810	2650	2490
0	3590	3010	2840	2680	2520
5	3620	3050	2880	2710	2550
10	3660	3080	2910	2750	2590
15	3690	3110	2940	2780	2620
20	3730	3150	2980	2810	2650
25	3760	3180	3010	2840	2680
30	3800	3220	3040	2880	2710
35	3840	3250	3080	2910	2750
40	3870	3280	3110	2940	2780
45	3910	3320	3150	2980	2810
46	3920	3330	3160	2990	2820

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS			VAPP = 110 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-30	3300	2730	2560	2410	2250
-25	3330	2760	2590	2430	2280
-20	3360	2790	2620	2460	2310
-15	3390	2820	2650	2490	2340
-10	3420	2850	2690	2530	2370
-5	3450	2880	2720	2560	2400
0	3490	2910	2750	2590	2430
5	3520	2950	2780	2620	2460
10	3550	2980	2810	2650	2490
15	3590	3010	2840	2680	2520
20	3620	3040	2880	2710	2550
25	3650	3080	2910	2740	2580
30	3690	3110	2940	2780	2620
35	3720	3140	2970	2810	2650
40	3760	3170	3000	2840	2680
45	3790	3210	3040	2870	2710
46	3800	3220	3050	2880	2720

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS			VAPP = 108 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-30	3200	2640	2480	2320	2170
-25	3230	2670	2510	2350	2200
-20	3260	2700	2540	2380	2220
-15	3290	2730	2560	2410	2250
-10	3320	2760	2590	2430	2280
-5	3350	2790	2620	2460	2310
0	3380	2820	2650	2490	2340
5	3410	2850	2680	2520	2370
10	3450	2880	2710	2550	2400
15	3480	2910	2740	2580	2430
20	3510	2940	2770	2610	2460
25	3540	2970	2800	2640	2480
30	3570	3000	2830	2670	2510
35	3610	3030	2870	2700	2540
40	3640	3060	2900	2730	2570
45	3670	3100	2930	2760	2600
46	3680	3110	2940	2770	2610

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS			VAPP = 105 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-30	3110	2550	2390	2240	2080
-25	3130	2580	2420	2260	2110
-20	3160	2600	2440	2290	2140
-15	3190	2630	2470	2310	2160
-10	3220	2660	2500	2340	2190
-5	3250	2690	2530	2370	2220
0	3270	2720	2550	2400	2240
5	3300	2740	2580	2430	2270
10	3330	2770	2610	2450	2300
15	3360	2800	2640	2480	2330
20	3390	2830	2670	2510	2360
25	3420	2860	2700	2540	2380
30	3450	2890	2730	2570	2410
35	3490	2920	2760	2600	2440
40	3520	2950	2780	2620	2470
45	3550	2980	2810	2650	2500
46	3560	2990	2820	2660	2510

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS			VAPP = 102 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-30	3010	2460	2300	2150	2000
-25	3030	2480	2320	2170	2020
-20	3060	2510	2350	2200	2050
-15	3080	2530	2370	2220	2070
-10	3110	2560	2400	2250	2100
-5	3140	2590	2430	2270	2120
0	3160	2610	2450	2300	2150
5	3190	2640	2480	2320	2170
10	3220	2670	2510	2350	2200
15	3250	2690	2530	2380	2230
20	3270	2720	2560	2400	2250
25	3300	2750	2590	2430	2280
30	3330	2780	2610	2460	2300
35	3360	2800	2640	2480	2330
40	3390	2830	2670	2510	2360
45	3420	2860	2700	2540	2390
46	3430	2870	2710	2550	2390

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS			VAPP = 98 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-30	2890	2350	2190	2040	1900
-25	2910	2370	2220	2060	1920
-20	2940	2390	2240	2090	1940
-15	2960	2420	2260	2110	1960
-10	2980	2440	2290	2130	1990
-5	3010	2470	2310	2160	2010
0	3030	2490	2330	2180	2030
5	3060	2520	2360	2210	2060
10	3090	2540	2380	2230	2080
15	3110	2570	2410	2260	2110
20	3140	2590	2430	2280	2130
25	3160	2620	2460	2300	2160
30	3190	2640	2480	2330	2180
35	3220	2670	2510	2360	2210
40	3240	2690	2540	2380	2230
45	3270	2720	2560	2410	2260
46	3280	2730	2570	2410	2260

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 10)



# LANDING DISTANCE - FEET

ACTUAL DISTANCE

FLAPS - LAND  
5000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE HEIGHT FROM MAXIMUM LANDING HEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3770	3180	3000	2830	2670
-30	3810	3220	3040	2870	2710
-25	3850	3260	3080	2910	2740
-20	3890	3300	3120	2950	2780
-15	3940	3330	3160	2990	2820
-10	3980	3380	3200	3030	2860
-5	4020	3420	3240	3070	2900
0	4060	3460	3280	3110	2940
5	4110	3500	3320	3150	2980
10	4150	3540	3360	3190	3020
15	4190	3580	3400	3230	3060
20	4240	3620	3440	3270	3090
25	4280	3660	3480	3310	3130
30	4320	3710	3520	3350	3170
32	4340	3720	3540	3360	3190

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3610	3030	2860	2690	2530
-30	3650	3060	2890	2730	2560
-25	3690	3100	2930	2760	2600
-20	3730	3140	2970	2800	2640
-15	3760	3170	3000	2830	2670
-10	3800	3210	3040	2870	2710
-5	3840	3250	3080	2910	2740
0	3880	3290	3110	2940	2780
5	3920	3330	3150	2980	2820
10	3960	3370	3190	3020	2850
15	4000	3400	3230	3060	2890
20	4040	3440	3270	3090	2930
25	4080	3480	3300	3130	2960
30	4120	3520	3340	3170	3000
35	4170	3560	3380	3210	3040
38	4190	3580	3400	3230	3060

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3600	3010	2840	2680	2510
-30	3630	3050	2880	2710	2550
-25	3670	3080	2910	2740	2580
-20	3710	3120	2950	2780	2620
-15	3740	3160	2980	2820	2650
-10	3780	3190	3020	2850	2690
-5	3820	3230	3060	2890	2720
0	3860	3270	3090	2930	2760
5	3900	3310	3130	2960	2800
10	3940	3350	3170	3000	2830
15	3980	3380	3210	3040	2870
20	4020	3420	3240	3070	2910
25	4060	3460	3280	3110	2940
30	4100	3500	3320	3150	2980
35	4140	3540	3360	3180	3020
39	4170	3570	3390	3210	3040

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3560	2980	2810	2640	2480
-30	3590	3010	2840	2680	2520
-25	3630	3050	2880	2710	2550
-20	3670	3080	2910	2750	2580
-15	3710	3120	2950	2780	2620
-10	3740	3160	2980	2820	2650
-5	3780	3190	3020	2850	2690
0	3820	3230	3060	2890	2720
5	3860	3270	3090	2920	2760
10	3900	3300	3130	2960	2800
15	3940	3340	3170	3000	2830
20	3980	3380	3200	3030	2870
25	4020	3420	3240	3070	2900
30	4060	3450	3280	3110	2940
35	4100	3490	3320	3140	2970
40	4140	3530	3350	3180	3010

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3520	2940	2770	2610	2450
-30	3560	2980	2810	2640	2480
-25	3590	3010	2840	2680	2520
-20	3630	3050	2880	2710	2550
-15	3670	3080	2910	2750	2580
-10	3700	3120	2950	2780	2620
-5	3740	3150	2980	2810	2650
0	3780	3190	3020	2850	2690
5	3820	3230	3050	2890	2720
10	3860	3260	3090	2920	2760
15	3890	3300	3130	2960	2790
20	3930	3340	3160	2990	2830
25	3970	3370	3200	3030	2860
30	4010	3410	3240	3070	2900
35	4050	3450	3270	3100	2930
40	4090	3490	3310	3140	2970
41	4100	3490	3320	3140	2980

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3490	2910	2740	2580	2420
-30	3520	2940	2770	2610	2450
-25	3560	2970	2810	2640	2480
-20	3590	3010	2840	2680	2520
-15	3630	3040	2870	2710	2550
-10	3660	3080	2910	2740	2580
-5	3700	3110	2940	2780	2620
0	3740	3150	2980	2810	2650
5	3770	3190	3020	2850	2680
10	3810	3220	3050	2880	2720
15	3850	3260	3090	2920	2750
20	3890	3300	3120	2950	2790
25	3930	3330	3160	2990	2820
30	3960	3370	3190	3020	2860
35	4000	3400	3230	3060	2890
40	4040	3440	3270	3090	2930
43	4060	3460	3290	3120	2950

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 11)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
5000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3430	2860	2690	2530	2370
-30	3460	2890	2720	2560	2400
-25	3500	2920	2750	2590	2430
-20	3530	2950	2790	2620	2460
-15	3570	2990	2820	2650	2500
-10	3600	3020	2850	2690	2530
-5	3640	3060	2890	2720	2560
0	3670	3090	2920	2760	2600
5	3710	3130	2960	2790	2630
10	3750	3160	2990	2820	2660
15	3780	3200	3030	2860	2700
20	3820	3230	3060	2890	2730
25	3860	3270	3090	2930	2760
30	3890	3300	3130	2960	2800
35	3930	3340	3160	3000	2830
40	3970	3370	3200	3030	2860
44	4000	3410	3230	3060	2890

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3340	2770	2600	2440	2290
-30	3370	2800	2630	2470	2320
-25	3400	2830	2660	2500	2350
-20	3430	2860	2690	2530	2380
-15	3470	2890	2730	2560	2410
-10	3500	2930	2760	2600	2440
-5	3530	2960	2790	2630	2470
0	3570	2990	2820	2660	2500
5	3600	3020	2860	2690	2530
10	3640	3060	2890	2730	2570
15	3670	3090	2920	2760	2600
20	3710	3130	2960	2790	2630
25	3740	3160	2990	2820	2660
30	3780	3190	3020	2860	2690
35	3810	3230	3060	2890	2730
40	3850	3260	3090	2920	2760
44	3880	3290	3120	2950	2790

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3240	2680	2520	2360	2200
-30	3270	2710	2540	2380	2230
-25	3300	2740	2570	2410	2260
-20	3330	2770	2600	2440	2290
-15	3360	2800	2630	2470	2320
-10	3400	2830	2660	2500	2350
-5	3430	2860	2690	2530	2380
0	3460	2890	2720	2560	2410
5	3490	2920	2760	2590	2440
10	3530	2950	2790	2630	2470
15	3560	2990	2820	2660	2500
20	3590	3020	2850	2690	2530
25	3620	3050	2880	2720	2560
30	3660	3080	2910	2750	2590
35	3690	3110	2950	2780	2620
40	3730	3150	2980	2810	2650
44	3760	3180	3010	2840	2680

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3150	2590	2430	2270	2120
-30	3170	2610	2450	2300	2140
-25	3200	2640	2480	2320	2170
-20	3230	2670	2510	2350	2200
-15	3260	2700	2540	2380	2230
-10	3290	2730	2560	2410	2250
-5	3320	2760	2590	2440	2280
0	3350	2790	2620	2460	2310
5	3380	2820	2650	2490	2340
10	3410	2850	2680	2520	2370
15	3440	2880	2710	2550	2400
20	3470	2910	2740	2580	2430
25	3500	2940	2770	2610	2450
30	3540	2970	2800	2640	2480
35	3570	3000	2830	2670	2510
40	3600	3030	2860	2700	2540
44	3630	3060	2890	2730	2570

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3050	2490	2330	2180	2030
-30	3070	2520	2360	2200	2050
-25	3100	2540	2380	2230	2080
-20	3120	2570	2410	2260	2100
-15	3150	2600	2440	2280	2130
-10	3180	2620	2460	2310	2160
-5	3210	2650	2490	2330	2180
0	3230	2680	2520	2360	2210
5	3260	2710	2550	2390	2240
10	3290	2740	2570	2420	2260
15	3320	2760	2600	2440	2290
20	3350	2790	2630	2470	2320
25	3380	2820	2660	2500	2350
30	3410	2850	2690	2530	2370
35	3440	2880	2710	2560	2400
40	3470	2910	2740	2580	2430
44	3500	2930	2770	2610	2450

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	2930	2380	2230	2070	1930
-30	2950	2410	2250	2100	1950
-25	2980	2430	2270	2120	1970
-20	3000	2450	2300	2140	2000
-15	3020	2480	2320	2170	2020
-10	3050	2500	2340	2190	2040
-5	3070	2530	2370	2220	2070
0	3100	2550	2400	2240	2090
5	3130	2580	2420	2270	2120
10	3150	2610	2450	2290	2140
15	3180	2630	2470	2320	2170
20	3210	2660	2500	2340	2190
25	3240	2680	2520	2370	2220
30	3260	2710	2550	2400	2250
35	3290	2740	2580	2420	2270
40	3320	2770	2610	2450	2300
44	3350	2790	2630	2470	2320

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 12)



## LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
6000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS VREF = 115 KIAS VAPP = 122 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3860	3260	3090	2910	2750
-30	3900	3300	3120	2950	2790
-25	3940	3340	3170	2990	2830
-20	3990	3380	3210	3030	2870
-15	4030	3430	3250	3070	2910
-10	4070	3470	3290	3120	2950
-5	4120	3510	3330	3160	2990
0	4160	3550	3370	3200	3030
5	4210	3600	3410	3240	3070
10	4250	3640	3460	3280	3110
15	4300	3680	3500	3320	3150
20	4340	3720	3540	3360	3190
25	4390	3770	3580	3400	3230
28	4410	3790	3610	3430	3250

WEIGHT = 11500 POUNDS VREF = 111 KIAS VAPP = 118 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3700	3110	2940	2770	2600
-30	3730	3140	2970	2800	2640
-25	3780	3180	3010	2840	2680
-20	3810	3220	3050	2880	2710
-15	3850	3260	3080	2920	2750
-10	3900	3300	3120	2950	2790
-5	3940	3340	3160	2990	2830
0	3980	3380	3200	3030	2860
5	4020	3420	3240	3070	2900
10	4060	3460	3280	3110	2940
15	4100	3500	3320	3150	2980
20	4140	3540	3360	3180	3010
25	4190	3580	3400	3220	3050
30	4230	3620	3440	3260	3090
35	4270	3660	3480	3300	3130

WEIGHT = 11400 POUNDS VREF = 111 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3680	3090	2920	2750	2590
-30	3720	3130	2950	2790	2620
-25	3760	3160	2990	2820	2660
-20	3790	3200	3030	2860	2700
-15	3830	3240	3070	2900	2730
-10	3870	3280	3100	2930	2770
-5	3920	3320	3140	2970	2810
0	3960	3360	3180	3010	2840
5	4000	3400	3220	3050	2880
10	4040	3440	3260	3090	2920
15	4080	3480	3300	3130	2960
20	4120	3520	3340	3160	2990
25	4160	3560	3380	3200	3030
30	4210	3600	3420	3240	3070
35	4250	3640	3460	3280	3110

WEIGHT = 11200 POUNDS VREF = 110 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3640	3050	2880	2720	2550
-30	3680	3090	2920	2750	2590
-25	3720	3130	2950	2790	2620
-20	3750	3160	2990	2820	2660
-15	3790	3200	3030	2860	2700
-10	3830	3240	3070	2900	2730
-5	3870	3280	3100	2930	2770
0	3910	3320	3140	2970	2810
5	3950	3360	3180	3010	2840
10	4000	3400	3220	3050	2880
15	4040	3430	3260	3090	2920
20	4080	3470	3300	3120	2950
25	4120	3510	3330	3160	2990
30	4160	3550	3370	3200	3030
35	4200	3590	3410	3240	3070
37	4220	3610	3430	3250	3080

WEIGHT = 11000 POUNDS VREF = 109 KIAS VAPP = 115 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3600	3020	2850	2680	2520
-30	3640	3050	2880	2720	2550
-25	3680	3090	2920	2750	2590
-20	3710	3130	2950	2790	2620
-15	3750	3160	2990	2820	2660
-10	3790	3200	3030	2860	2700
-5	3830	3240	3070	2900	2730
0	3870	3280	3100	2930	2770
5	3910	3310	3140	2970	2800
10	3950	3350	3180	3010	2840
15	3990	3390	3220	3040	2880
20	4030	3430	3250	3080	2910
25	4070	3470	3290	3120	2950
30	4110	3510	3330	3160	2990
35	4150	3540	3370	3190	3020
38	4180	3570	3390	3220	3050

WEIGHT = 10800 POUNDS VREF = 108 KIAS VAPP = 114 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3570	2980	2810	2650	2490
-30	3600	3020	2850	2680	2520
-25	3640	3050	2880	2720	2550
-20	3670	3090	2920	2750	2590
-15	3710	3120	2950	2790	2620
-10	3750	3160	2990	2820	2660
-5	3790	3200	3030	2860	2690
0	3830	3240	3060	2890	2730
5	3870	3270	3100	2930	2770
10	3910	3310	3140	2970	2800
15	3940	3350	3170	3000	2840
20	3980	3390	3210	3040	2870
25	4020	3420	3250	3080	2910
30	4060	3460	3280	3110	2940
35	4100	3500	3320	3150	2980
40	4140	3540	3360	3190	3020

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 13)



# MODEL 525A

## SECTION IV - PERFORMANCE APPROACH AND LANDING

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
6000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS			VAPP = 113 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	3510	2930	2760	2600	2440
-30	3540	2960	2790	2630	2470
-25	3580	3000	2830	2660	2500
-20	3610	3030	2860	2700	2540
-15	3650	3070	2900	2730	2570
-10	3690	3100	2930	2770	2600
-5	3720	3140	2970	2800	2640
0	3760	3170	3000	2840	2670
5	3800	3210	3040	2870	2710
10	3840	3250	3070	2910	2740
15	3880	3280	3110	2940	2780
20	3910	3320	3150	2980	2810
25	3950	3360	3180	3010	2850
30	3990	3390	3220	3050	2880
35	4030	3430	3250	3080	2920
40	4070	3470	3290	3120	2950
42	4090	3490	3310	3140	2970

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS			VAPP = 110 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	3410	2840	2670	2510	2350
-30	3440	2870	2700	2540	2380
-25	3480	2900	2730	2570	2410
-20	3510	2930	2770	2600	2450
-15	3550	2970	2800	2640	2480
-10	3580	3000	2830	2670	2510
-5	3620	3040	2870	2700	2540
0	3650	3070	2900	2740	2580
5	3690	3110	2940	2770	2610
10	3730	3140	2970	2800	2640
15	3760	3180	3000	2840	2680
20	3800	3210	3040	2870	2710
25	3830	3240	3070	2900	2740
30	3870	3280	3110	2940	2780
35	3910	3320	3140	2970	2810
40	3950	3350	3180	3010	2840
42	3960	3370	3190	3020	2860

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS			VAPP = 108 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	3320	2750	2580	2420	2270
-30	3340	2770	2610	2450	2290
-25	3380	2810	2640	2480	2320
-20	3410	2840	2670	2510	2350
-15	3440	2870	2700	2540	2390
-10	3470	2900	2740	2570	2420
-5	3510	2930	2770	2610	2450
0	3540	2970	2800	2640	2480
5	3580	3000	2830	2670	2510
10	3610	3030	2860	2700	2540
15	3640	3070	2900	2730	2570
20	3680	3100	2930	2760	2600
25	3710	3130	2960	2800	2640
30	3750	3170	3000	2830	2670
35	3780	3200	3030	2860	2700
40	3820	3230	3060	2890	2730
42	3840	3250	3080	2910	2750

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS			VAPP = 105 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	3220	2650	2490	2330	2180
-30	3240	2680	2520	2360	2200
-25	3270	2710	2550	2390	2230
-20	3300	2740	2570	2420	2260
-15	3330	2770	2600	2440	2290
-10	3360	2800	2630	2470	2320
-5	3390	2830	2660	2500	2350
0	3430	2860	2690	2530	2380
5	3460	2890	2730	2560	2410
10	3490	2920	2760	2600	2440
15	3520	2950	2790	2630	2470
20	3560	2980	2820	2660	2500
25	3590	3020	2850	2690	2530
30	3620	3050	2880	2720	2560
35	3660	3080	2910	2750	2590
40	3690	3110	2940	2780	2620
42	3700	3130	2960	2790	2630

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS			VAPP = 102 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	3110	2560	2390	2240	2090
-30	3140	2580	2420	2260	2110
-25	3170	2610	2450	2290	2140
-20	3190	2630	2470	2320	2160
-15	3220	2660	2500	2340	2190
-10	3250	2690	2530	2370	2220
-5	3280	2720	2560	2400	2250
0	3310	2750	2590	2430	2270
5	3340	2780	2610	2460	2300
10	3370	2810	2640	2490	2330
15	3400	2840	2670	2510	2360
20	3430	2870	2700	2540	2390
25	3460	2890	2730	2570	2420
30	3490	2930	2760	2600	2440
35	3520	2960	2790	2630	2470
40	3560	2990	2820	2660	2500
42	3570	3000	2830	2670	2510

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS			VAPP = 98 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	2990	2440	2280	2130	1980
-30	3010	2460	2300	2150	2000
-25	3040	2490	2330	2180	2030
-20	3060	2510	2350	2200	2050
-15	3090	2540	2380	2230	2080
-10	3120	2570	2410	2250	2100
-5	3140	2590	2430	2280	2130
0	3170	2620	2460	2300	2150
5	3200	2650	2490	2330	2180
10	3230	2670	2510	2360	2210
15	3250	2700	2540	2380	2230
20	3280	2730	2570	2410	2260
25	3310	2750	2590	2440	2290
30	3340	2780	2620	2460	2310
35	3370	2810	2650	2490	2340
40	3400	2840	2680	2520	2370
42	3410	2850	2690	2530	2380

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 14)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
7000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3950	3350	3170 3000 2830		
-30	4000	3390	3210 3040 2870		
-25	4040	3430	3250 3080 2910		
-20	4090	3480	3300 3120 2950		
-15	4130	3520	3340 3160 2990		
-10	4180	3560	3380 3210 3040		
-5	4220	3610	3430 3250 3080		
0	4270	3650	3470 3290 3120		
5	4320	3700	3510 3340 3160		
10	4360	3740	3560 3380 3200		
15	4410	3780	3600 3420 3250		
20	4450	3830	3640 3460 3290		
24	4490	3860	3680 3500 3320		

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3790	3190	3020 2850 2680		
-30	3820	3230	3050 2880 2720		
-25	3870	3270	3090 2920 2760		
-20	3910	3310	3130 2960 2790		
-15	3950	3350	3170 3000 2830		
-10	3990	3390	3210 3040 2870		
-5	4030	3430	3250 3080 2910		
0	4080	3470	3290 3120 2950		
5	4120	3510	3330 3160 2990		
10	4160	3550	3370 3200 3030		
15	4210	3600	3420 3240 3070		
20	4250	3640	3460 3280 3110		
25	4290	3680	3500 3320 3150		
30	4340	3720	3540 3360 3190		
31	4350	3730	3550 3370 3190		

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3770	3170	3000 2830 2660		
-30	3810	3210	3040 2870 2700		
-25	3850	3250	3070 2900 2740		
-20	3890	3290	3110 2940 2780		
-15	3930	3330	3150 2980 2810		
-10	3970	3370	3190 3020 2850		
-5	4010	3410	3230 3060 2890		
0	4060	3450	3270 3100 2930		
5	4100	3490	3310 3140 2970		
10	4140	3530	3350 3180 3010		
15	4180	3570	3390 3220 3050		
20	4230	3610	3430 3260 3090		
25	4270	3660	3470 3300 3130		
30	4310	3700	3520 3340 3170		
32	4330	3710	3530 3350 3180		

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3730	3130	2960 2790 2630		
-30	3770	3170	3000 2830 2670		
-25	3810	3210	3040 2870 2700		
-20	3850	3250	3070 2910 2740		
-15	3890	3290	3110 2940 2780		
-10	3930	3330	3150 2980 2810		
-5	3970	3370	3190 3020 2850		
0	4010	3410	3230 3060 2890		
5	4050	3450	3270 3100 2930		
10	4100	3490	3310 3140 2970		
15	4140	3530	3350 3180 3010		
20	4180	3570	3390 3220 3040		
25	4220	3610	3430 3250 3080		
30	4260	3650	3470 3290 3120		
33	4290	3680	3490 3320 3150		

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3690	3100	2930 2760 2600		
-30	3730	3130	2960 2790 2630		
-25	3760	3170	3000 2830 2670		
-20	3800	3210	3040 2870 2700		
-15	3840	3250	3070 2910 2740		
-10	3880	3290	3110 2940 2780		
-5	3920	3330	3150 2980 2810		
0	3970	3370	3190 3020 2850		
5	4010	3410	3230 3060 2890		
10	4050	3450	3270 3100 2930		
15	4090	3490	3310 3130 2970		
20	4130	3520	3350 3170 3000		
25	4170	3560	3390 3210 3040		
30	4220	3600	3430 3250 3080		
35	4260	3650	3460 3290 3120		

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3650	3060	2890 2720 2560		
-30	3690	3100	2920 2760 2590		
-25	3720	3130	2960 2790 2630		
-20	3760	3170	3000 2830 2670		
-15	3800	3210	3040 2870 2700		
-10	3840	3250	3070 2900 2740		
-5	3880	3280	3110 2940 2780		
0	3920	3320	3150 2980 2810		
5	3960	3360	3190 3020 2850		
10	4000	3400	3230 3050 2890		
15	4040	3440	3260 3090 2920		
20	4080	3480	3300 3130 2960		
25	4120	3520	3340 3170 3000		
30	4170	3560	3380 3210 3040		
35	4210	3600	3420 3240 3070		
36	4220	3610	3430 3250 3080		

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 15)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
7000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3590	3000	2830	2670	2510
-30	3620	3040	2870	2700	2540
-25	3660	3080	2900	2740	2580
-20	3700	3110	2940	2770	2610
-15	3740	3150	2980	2810	2650
-10	3780	3190	3010	2840	2680
-5	3810	3220	3050	2880	2720
0	3850	3260	3090	2920	2750
5	3890	3300	3120	2950	2790
10	3930	3340	3160	2990	2830
15	3970	3370	3200	3030	2860
20	4010	3410	3240	3060	2900
25	4050	3450	3270	3100	2930
30	4090	3490	3310	3140	2970
35	4130	3530	3350	3180	3010
38	4160	3550	3370	3200	3030

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3490	2910	2740	2580	2420
-30	3520	2940	2780	2610	2450
-25	3560	2980	2810	2640	2490
-20	3590	3010	2840	2680	2520
-15	3630	3050	2880	2710	2550
-10	3670	3080	2910	2750	2590
-5	3700	3120	2950	2780	2620
0	3740	3150	2980	2820	2650
5	3780	3190	3020	2850	2690
10	3820	3230	3050	2890	2720
15	3850	3260	3090	2920	2760
20	3890	3300	3120	2960	2790
25	3930	3330	3160	2990	2830
30	3970	3370	3200	3030	2860
35	4010	3410	3230	3060	2900
40	4050	3450	3270	3100	2930

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3390	2820	2650	2490	2330
-30	3420	2850	2680	2520	2360
-25	3450	2880	2710	2550	2390
-20	3490	2910	2740	2580	2420
-15	3520	2940	2780	2610	2460
-10	3560	2980	2810	2650	2490
-5	3590	3010	2840	2680	2520
0	3630	3050	2880	2710	2550
5	3660	3080	2910	2750	2590
10	3700	3120	2950	2780	2620
15	3730	3150	2980	2810	2650
20	3770	3180	3010	2850	2680
25	3800	3220	3050	2880	2720
30	3840	3250	3080	2910	2750
35	3880	3290	3120	2950	2780
40	3920	3320	3150	2980	2820

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3290	2720	2550	2400	2240
-30	3320	2750	2580	2420	2270
-25	3350	2780	2610	2450	2300
-20	3380	2810	2640	2480	2330
-15	3410	2840	2670	2510	2360
-10	3440	2870	2710	2540	2390
-5	3470	2900	2740	2580	2420
0	3510	2940	2770	2610	2450
5	3540	2970	2800	2640	2480
10	3580	3000	2830	2670	2510
15	3610	3030	2860	2700	2540
20	3640	3060	2900	2730	2570
25	3680	3100	2930	2760	2600
30	3710	3130	2960	2800	2640
35	3750	3160	2990	2830	2670
40	3780	3200	3030	2860	2700

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3180	2620	2460	2300	2150
-30	3210	2650	2480	2330	2170
-25	3240	2670	2510	2350	2200
-20	3260	2700	2540	2380	2230
-15	3290	2730	2570	2410	2260
-10	3320	2760	2600	2440	2280
-5	3350	2790	2630	2470	2310
0	3390	2820	2660	2500	2340
5	3420	2850	2690	2530	2370
10	3450	2880	2720	2560	2400
15	3480	2910	2750	2590	2430
20	3510	2940	2780	2620	2460
25	3540	2970	2810	2650	2490
30	3580	3000	2840	2680	2520
35	3610	3040	2870	2710	2550
40	3640	3070	2900	2740	2580

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3060	2500	2340	2190	2040
-30	3080	2520	2370	2210	2060
-25	3110	2550	2390	2240	2090
-20	3130	2580	2420	2260	2110
-15	3160	2600	2440	2290	2140
-10	3190	2630	2470	2310	2160
-5	3210	2660	2500	2340	2190
0	3240	2690	2530	2370	2220
5	3270	2710	2550	2400	2240
10	3300	2740	2580	2430	2270
15	3330	2770	2610	2450	2300
20	3360	2800	2640	2480	2330
25	3390	2830	2670	2510	2350
30	3420	2860	2700	2540	2380
35	3450	2890	2720	2560	2410
40	3480	2920	2750	2590	2440

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 16)



## LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
8000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE HEIGHT FROM MAXIMUM LANDING HEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4050	3440	3260	3080	2910
-30	4090	3480	3300	3130	2960
-25	4140	3530	3350	3170	3000
-20	4190	3570	3390	3210	3040
-15	4230	3620	3440	3260	3090
-10	4280	3660	3480	3300	3130
-5	4330	3710	3520	3350	3170
0	4380	3750	3570	3390	3220
5	4430	3800	3620	3440	3260
10	4470	3850	3660	3480	3300
15	4520	3890	3710	3520	3350
20	4570	3940	3750	3570	3390

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3880	3270	3100	2930	2760
-30	3920	3320	3140	2970	2800
-25	3960	3360	3180	3010	2840
-20	4000	3400	3220	3050	2880
-15	4050	3440	3260	3090	2920
-10	4090	3480	3300	3130	2960
-5	4130	3520	3350	3170	3000
0	4180	3570	3390	3210	3040
5	4220	3610	3430	3250	3080
10	4270	3650	3470	3300	3120
15	4310	3700	3510	3340	3160
20	4360	3740	3560	3380	3200
25	4400	3780	3600	3420	3240
27	4420	3800	3620	3440	3260

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3860	3260	3080	2910	2740
-30	3900	3300	3120	2950	2780
-25	3940	3340	3160	2990	2820
-20	3980	3380	3200	3030	2860
-15	4020	3420	3240	3070	2900
-10	4070	3460	3280	3110	2940
-5	4110	3500	3320	3150	2980
0	4160	3550	3370	3190	3020
5	4200	3590	3410	3230	3060
10	4250	3630	3450	3270	3100
15	4290	3670	3490	3310	3140
20	4330	3720	3530	3360	3180
25	4380	3760	3580	3400	3220
28	4410	3790	3600	3420	3250

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3810	3220	3040	2870	2710
-30	3860	3260	3080	2910	2750
-25	3900	3300	3120	2950	2780
-20	3940	3340	3160	2990	2820
-15	3980	3380	3200	3030	2860
-10	4020	3420	3240	3070	2900
-5	4070	3460	3280	3110	2940
0	4110	3500	3320	3150	2980
5	4150	3540	3370	3190	3020
10	4200	3590	3410	3230	3060
15	4240	3630	3450	3270	3100
20	4290	3670	3490	3310	3140
25	4330	3710	3530	3350	3180
30	4370	3760	3570	3390	3220

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3770	3180	3010	2840	2670
-30	3810	3220	3040	2870	2710
-25	3850	3260	3080	2910	2750
-20	3900	3300	3120	2950	2780
-15	3940	3340	3160	2990	2820
-10	3980	3380	3200	3030	2860
-5	4020	3420	3240	3070	2900
0	4070	3460	3280	3110	2940
5	4110	3500	3320	3150	2980
10	4150	3540	3360	3190	3020
15	4190	3580	3400	3230	3060
20	4240	3620	3440	3270	3100
25	4280	3670	3480	3310	3140
30	4320	3710	3530	3350	3170
31	4330	3720	3530	3360	3180

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3730	3140	2970	2800	2640
-30	3770	3180	3010	2840	2670
-25	3810	3220	3040	2870	2710
-20	3850	3260	3080	2910	2750
-15	3890	3300	3120	2950	2780
-10	3930	3340	3160	2990	2820
-5	3980	3380	3200	3030	2860
0	4020	3420	3240	3070	2900
5	4060	3460	3280	3110	2940
10	4100	3500	3320	3150	2980
15	4150	3540	3360	3180	3010
20	4190	3580	3400	3220	3050
25	4230	3620	3440	3260	3090
30	4270	3660	3480	3300	3130
33	4300	3680	3500	3330	3150

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 17)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
8000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS		VAPP = 113 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3670	3080	2910	2740	2580
-30	3710	3120	2950	2780	2620
-25	3750	3160	2990	2820	2650
-20	3790	3190	3020	2850	2690
-15	3830	3230	3060	2890	2730
-10	3870	3270	3100	2930	2760
-5	3910	3310	3140	2970	2800
0	3950	3350	3180	3000	2840
5	3990	3390	3210	3040	2880
10	4030	3430	3250	3080	2910
15	4070	3470	3290	3120	2950
20	4110	3510	3330	3160	2990
25	4160	3550	3370	3190	3020
30	4200	3590	3410	3230	3060
35	4240	3630	3450	3270	3100

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS		VAPP = 110 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3570	2990	2820	2650	2490
-30	3610	3020	2850	2690	2520
-25	3640	3060	2890	2720	2560
-20	3680	3090	2920	2750	2590
-15	3720	3130	2960	2790	2630
-10	3750	3170	2990	2830	2660
-5	3790	3200	3030	2860	2700
0	3830	3240	3070	2900	2730
5	3870	3280	3100	2930	2770
10	3910	3320	3140	2970	2810
15	3950	3350	3180	3010	2840
20	3990	3390	3210	3040	2880
25	4030	3430	3250	3080	2910
30	4070	3470	3290	3120	2950
35	4110	3500	3330	3150	2990
37	4130	3530	3350	3180	3010

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS		VAPP = 108 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3470	2890	2720	2560	2400
-30	3500	2920	2750	2590	2430
-25	3530	2950	2790	2620	2460
-20	3570	2990	2820	2660	2500
-15	3600	3020	2850	2690	2530
-10	3640	3060	2890	2720	2560
-5	3680	3090	2920	2760	2600
0	3710	3130	2960	2790	2630
5	3750	3160	2990	2830	2660
10	3790	3200	3030	2860	2700
15	3830	3240	3060	2900	2730
20	3860	3270	3100	2930	2770
25	3900	3310	3130	2960	2800
30	3940	3340	3170	3000	2830
35	3980	3380	3210	3040	2870
37	4000	3400	3230	3060	2890

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS		VAPP = 105 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3360	2790	2620	2460	2300
-30	3390	2820	2650	2490	2330
-25	3420	2850	2680	2520	2370
-20	3450	2880	2710	2550	2400
-15	3490	2910	2750	2590	2430
-10	3520	2950	2780	2620	2460
-5	3560	2980	2810	2650	2490
0	3590	3010	2850	2680	2520
5	3630	3050	2880	2720	2560
10	3660	3080	2910	2750	2590
15	3700	3120	2950	2780	2620
20	3730	3150	2980	2810	2650
25	3770	3180	3010	2850	2680
30	3800	3220	3050	2880	2720
35	3840	3250	3080	2910	2750
37	3860	3270	3100	2930	2770

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS		VAPP = 102 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3250	2680	2520	2360	2210
-30	3280	2710	2550	2390	2240
-25	3310	2740	2580	2420	2260
-20	3340	2770	2610	2450	2290
-15	3370	2800	2640	2480	2320
-10	3400	2830	2670	2510	2350
-5	3430	2860	2700	2540	2380
0	3470	2900	2730	2570	2410
5	3500	2930	2760	2600	2440
10	3530	2960	2790	2630	2470
15	3560	2990	2820	2660	2500
20	3600	3020	2850	2690	2530
25	3630	3050	2890	2720	2560
30	3660	3090	2920	2750	2600
35	3700	3120	2950	2790	2630
37	3720	3140	2970	2810	2640

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS		VAPP = 98 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3120	2560	2400	2240	2090
-30	3150	2590	2430	2270	2120
-25	3170	2620	2450	2300	2150
-20	3200	2640	2480	2320	2170
-15	3230	2670	2510	2350	2200
-10	3260	2700	2540	2380	2230
-5	3290	2730	2570	2410	2260
0	3320	2760	2590	2440	2280
5	3350	2790	2620	2470	2310
10	3380	2820	2650	2500	2340
15	3410	2850	2680	2520	2370
20	3440	2870	2710	2550	2400
25	3470	2910	2740	2580	2430
30	3500	2940	2770	2610	2450
35	3530	2970	2800	2640	2480
37	3550	2980	2820	2660	2500

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 18)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

# FLAPS - LAND 9000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS VREF = 115 KIAS VAPP = 122 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4150	3530	3350	3180	3000
-30	4200	3580	3400	3220	3050
-25	4240	3630	3440	3270	3090
-20	4290	3670	3490	3310	3140
-15	4340	3720	3530	3360	3180
-10	4390	3770	3580	3400	3230
-5	4440	3810	3630	3450	3270
0	4490	3860	3670	3490	3320
5	4540	3910	3720	3540	3360
10	4590	3960	3770	3590	3410
14	4630	4000	3810	3620	3440

WEIGHT = 11500 POUNDS VREF = 111 KIAS VAPP = 118 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3970	3360	3190	3010	2840
-30	4010	3410	3230	3050	2880
-25	4060	3450	3270	3100	2930
-20	4100	3490	3310	3140	2970
-15	4150	3540	3360	3180	3010
-10	4190	3580	3400	3220	3050
-5	4240	3620	3440	3270	3090
0	4290	3670	3490	3310	3130
5	4330	3710	3530	3350	3180
10	4380	3760	3570	3400	3220
15	4430	3800	3620	3440	3260
20	4470	3850	3660	3480	3300
23	4500	3870	3690	3510	3330

WEIGHT = 11400 POUNDS VREF = 111 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3950	3340	3170	2990	2830
-30	3990	3390	3210	3030	2870
-25	4040	3430	3250	3080	2910
-20	4080	3470	3290	3120	2950
-15	4130	3510	3330	3160	2990
-10	4170	3560	3380	3200	3030
-5	4220	3600	3420	3240	3070
0	4260	3650	3460	3290	3110
5	4310	3690	3510	3330	3160
10	4360	3730	3550	3370	3200
15	4400	3780	3590	3420	3240
20	4450	3820	3640	3460	3280
24	4490	3860	3670	3490	3320

WEIGHT = 11200 POUNDS VREF = 110 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3910	3300	3130	2960	2790
-30	3950	3350	3170	3000	2830
-25	3990	3390	3210	3040	2870
-20	4040	3430	3250	3080	2910
-15	4080	3470	3290	3120	2950
-10	4130	3510	3340	3160	2990
-5	4170	3560	3380	3200	3030
0	4220	3600	3420	3240	3070
5	4260	3650	3460	3290	3110
10	4310	3690	3510	3330	3160
15	4350	3730	3550	3370	3200
20	4400	3780	3590	3410	3240
25	4440	3820	3630	3450	3280
26	4450	3830	3640	3460	3290

WEIGHT = 11000 POUNDS VREF = 109 KIAS VAPP = 115 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3860	3260	3090	2920	2750
-30	3910	3310	3130	2960	2790
-25	3950	3350	3170	3000	2830
-20	3990	3390	3210	3040	2870
-15	4040	3430	3250	3080	2910
-10	4080	3470	3290	3120	2950
-5	4120	3510	3330	3160	2990
0	4170	3560	3380	3200	3030
5	4210	3600	3420	3240	3070
10	4260	3640	3460	3280	3110
15	4300	3680	3500	3330	3150
20	4350	3730	3540	3370	3190
25	4390	3770	3590	3410	3230
28	4420	3800	3610	3430	3260

WEIGHT = 10800 POUNDS VREF = 108 KIAS VAPP = 114 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	3820	3230	3050	2880	2710
-30	3860	3270	3090	2920	2750
-25	3910	3310	3130	2960	2790
-20	3950	3350	3170	3000	2830
-15	3990	3390	3210	3040	2870
-10	4030	3430	3250	3080	2910
-5	4080	3470	3290	3120	2950
0	4120	3510	3330	3160	2990
5	4160	3550	3370	3200	3030
10	4210	3600	3420	3240	3070
15	4250	3640	3460	3280	3110
20	4300	3680	3500	3320	3150
25	4340	3720	3540	3360	3190
29	4380	3760	3570	3390	3220

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 19)



# MODEL 525A

## SECTION IV - PERFORMANCE APPROACH AND LANDING

### LANDING DISTANCE - FEET ACTUAL DISTANCE

### FLAPS - LAND 9000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3760	3170	2990	2820	2660
-30	3800	3200	3030	2860	2700
-25	3840	3240	3070	2900	2730
-20	3880	3280	3110	2940	2770
-15	3920	3320	3150	2980	2810
-10	3960	3360	3190	3010	2850
-5	4010	3400	3230	3050	2890
0	4050	3440	3270	3090	2920
5	4090	3480	3310	3130	2960
10	4130	3530	3350	3170	3000
15	4180	3570	3390	3210	3040
20	4220	3610	3430	3250	3080
25	4260	3650	3470	3290	3120
30	4310	3690	3510	3330	3160
32	4320	3710	3520	3350	3170

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3650	3070	2890	2730	2560
-30	3690	3100	2930	2760	2600
-25	3730	3140	2970	2800	2640
-20	3770	3180	3000	2840	2670
-15	3810	3210	3040	2870	2710
-10	3850	3250	3080	2910	2740
-5	3890	3290	3120	2950	2780
0	3930	3330	3150	2980	2820
5	3970	3370	3190	3020	2860
10	4010	3410	3230	3060	2890
15	4050	3450	3270	3100	2930
20	4090	3490	3310	3140	2970
25	4130	3530	3350	3170	3000
30	4170	3560	3390	3210	3040
35	4210	3600	3430	3250	3080

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3550	2960	2790	2630	2470
-30	3580	3000	2830	2660	2500
-25	3620	3030	2860	2700	2540
-20	3650	3070	2900	2730	2570
-15	3690	3100	2930	2770	2610
-10	3730	3140	2970	2800	2640
-5	3770	3180	3010	2840	2680
0	3800	3210	3040	2870	2710
5	3840	3250	3080	2910	2750
10	3880	3290	3120	2950	2780
15	3920	3330	3150	2980	2820
20	3960	3360	3190	3020	2850
25	4000	3400	3230	3050	2890
30	4040	3440	3260	3090	2920
35	4080	3480	3300	3130	2960

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3440	2860	2690	2530	2370
-30	3470	2890	2730	2560	2400
-25	3500	2930	2760	2590	2440
-20	3540	2960	2790	2630	2470
-15	3570	2990	2820	2660	2500
-10	3610	3030	2860	2690	2530
-5	3640	3060	2890	2730	2570
0	3680	3100	2930	2760	2600
5	3720	3130	2960	2800	2630
10	3750	3170	3000	2830	2670
15	3790	3200	3030	2860	2700
20	3820	3240	3060	2900	2730
25	3860	3270	3100	2930	2770
30	3900	3310	3130	2970	2800
35	3940	3340	3170	3000	2840

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3320	2750	2590	2430	2270
-30	3350	2780	2620	2460	2300
-25	3380	2810	2650	2490	2330
-20	3420	2840	2680	2520	2360
-15	3450	2880	2710	2550	2390
-10	3480	2910	2740	2580	2420
-5	3510	2940	2770	2610	2450
0	3550	2970	2810	2640	2490
5	3580	3010	2840	2680	2520
10	3620	3040	2870	2710	2550
15	3650	3070	2900	2740	2580
20	3690	3110	2940	2770	2610
25	3720	3140	2970	2800	2640
30	3760	3170	3000	2840	2680
35	3790	3210	3040	2870	2710

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3190	2630	2460	2310	2150
-30	3220	2650	2490	2330	2180
-25	3240	2680	2520	2360	2210
-20	3270	2710	2550	2390	2240
-15	3300	2740	2580	2420	2270
-10	3330	2770	2610	2450	2290
-5	3360	2800	2640	2480	2320
0	3400	2830	2670	2510	2350
5	3430	2860	2700	2540	2380
10	3460	2890	2730	2570	2410
15	3490	2920	2760	2600	2440
20	3520	2950	2790	2630	2470
25	3560	2990	2820	2660	2500
30	3590	3020	2850	2690	2530
35	3620	3050	2880	2720	2560

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

Figure 4-47 (Sheet 20)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
10,000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS VREF = 115 KIAS VAPP = 122 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4300	3670	3490	3310	3130
-30	4350	3720	3530	3350	3180
-25	4400	3770	3580	3400	3220
-20	4450	3820	3630	3450	3270
-15	4500	3870	3680	3500	3320
-10	4550	3920	3730	3540	3360
-5	4610	3970	3780	3590	3410
0	4660	4020	3830	3640	3460
5	4710	4070	3880	3690	3510
8	4740	4100	3900	3720	3530

WEIGHT = 11500 POUNDS VREF = 111 KIAS VAPP = 118 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4110	3490	3310	3140	2960
-30	4160	3540	3360	3180	3010
-25	4200	3580	3400	3220	3050
-20	4250	3630	3450	3270	3090
-15	4300	3680	3490	3310	3140
-10	4350	3720	3540	3360	3180
-5	4400	3770	3580	3400	3220
0	4450	3810	3630	3450	3270
5	4500	3860	3670	3490	3310
10	4540	3910	3720	3540	3360
15	4590	3950	3770	3580	3400
18	4620	3980	3790	3610	3430

WEIGHT = 11400 POUNDS VREF = 111 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4090	3470	3290	3120	2940
-30	4140	3520	3340	3160	2990
-25	4180	3560	3380	3200	3030
-20	4230	3610	3420	3250	3070
-15	4280	3650	3470	3290	3120
-10	4320	3700	3510	3330	3160
-5	4370	3740	3560	3380	3200
0	4420	3790	3610	3420	3250
5	4470	3840	3650	3470	3290
10	4520	3880	3700	3510	3340
15	4570	3930	3740	3560	3380
19	4610	3970	3780	3590	3410

WEIGHT = 11200 POUNDS VREF = 110 KIAS VAPP = 117 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4050	3430	3250	3080	2910
-30	4090	3480	3290	3120	2950
-25	4140	3520	3340	3160	2990
-20	4180	3560	3380	3200	3030
-15	4230	3610	3430	3250	3070
-10	4280	3650	3470	3290	3120
-5	4320	3700	3510	3340	3160
0	4370	3750	3560	3380	3200
5	4420	3790	3610	3420	3250
10	4470	3840	3650	3470	3290
15	4510	3880	3690	3510	3330
20	4560	3930	3740	3560	3380
21	4570	3940	3750	3560	3390

WEIGHT = 11000 POUNDS VREF = 109 KIAS VAPP = 115 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4000	3390	3210	3040	2870
-30	4050	3430	3250	3080	2910
-25	4090	3480	3300	3120	2950
-20	4140	3520	3340	3160	2990
-15	4180	3560	3380	3210	3030
-10	4230	3610	3430	3250	3070
-5	4280	3650	3470	3290	3120
0	4320	3700	3510	3330	3160
5	4370	3740	3560	3380	3200
10	4420	3790	3600	3420	3240
15	4460	3830	3650	3460	3290
20	4510	3880	3690	3510	3330
23	4540	3900	3720	3530	3360

WEIGHT = 10800 POUNDS VREF = 108 KIAS VAPP = 114 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	3960	3350	3170	3000	2830
-30	4000	3390	3210	3040	2870
-25	4050	3430	3250	3080	2910
-20	4090	3480	3300	3120	2950
-15	4140	3520	3340	3160	2990
-10	4180	3560	3380	3200	3030
-5	4230	3610	3420	3250	3070
0	4270	3650	3470	3290	3120
5	4320	3700	3510	3330	3160
10	4360	3740	3550	3380	3200
15	4410	3780	3600	3420	3240
20	4460	3830	3640	3460	3280
25	4500	3870	3690	3500	3330

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 21)



## LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
10,000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS			VAPP = 113 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3890	3290	3110 2940 2770		
-30	3940	3330	3150 2980 2810		
-25	3980	3370	3190 3020 2850		
-20	4020	3410	3230 3060 2890		
-15	4060	3450	3270 3100 2930		
-10	4110	3490	3310 3140 2970		
-5	4150	3540	3360 3180 3010		
0	4200	3580	3400 3220 3050		
5	4240	3620	3440 3260 3090		
10	4290	3670	3480 3300 3130		
15	4330	3710	3520 3350 3170		
20	4380	3750	3570 3390 3210		
25	4420	3800	3610 3430 3250		
28	4450	3820	3640 3450 3280		

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS			VAPP = 110 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3780	3180	3010 2840 2670		
-30	3820	3220	3050 2870 2710		
-25	3860	3260	3080 2910 2740		
-20	3900	3300	3120 2950 2780		
-15	3940	3340	3160 2990 2820		
-10	3990	3380	3200 3030 2860		
-5	4030	3420	3240 3070 2900		
0	4070	3460	3280 3110 2940		
5	4110	3500	3320 3150 2980		
10	4160	3540	3360 3190 3020		
15	4200	3580	3400 3230 3050		
20	4240	3620	3440 3270 3090		
25	4290	3670	3480 3310 3130		
30	4330	3710	3520 3350 3170		
32	4350	3720	3540 3360 3190		

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS			VAPP = 108 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3670	3080	2900 2740 2570		
-30	3710	3110	2940 2770 2610		
-25	3740	3150	2980 2810 2640		
-20	3780	3190	3010 2840 2680		
-15	3820	3230	3050 2880 2710		
-10	3860	3260	3090 2920 2750		
-5	3900	3300	3130 2950 2790		
0	3940	3340	3160 2990 2830		
5	3980	3380	3200 3030 2860		
10	4020	3420	3240 3070 2900		
15	4060	3460	3280 3110 2940		
20	4110	3500	3320 3140 2970		
25	4150	3540	3360 3180 3010		
30	4190	3580	3400 3220 3050		
33	4220	3600	3420 3250 3080		

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS			VAPP = 105 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3550	2970	2800 2630 2470		
-30	3590	3000	2830 2660 2500		
-25	3620	3040	2860 2700 2540		
-20	3660	3070	2900 2730 2570		
-15	3700	3110	2940 2770 2600		
-10	3740	3140	2970 2800 2640		
-5	3770	3180	3010 2840 2670		
0	3810	3220	3040 2870 2710		
5	3850	3250	3080 2910 2740		
10	3890	3290	3120 2950 2780		
15	3930	3330	3150 2980 2810		
20	3970	3360	3190 3020 2850		
25	4000	3400	3230 3050 2890		
30	4040	3440	3260 3090 2920		
33	4070	3470	3290 3120 2950		

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS			VAPP = 102 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3430	2850	2690 2520 2360		
-30	3470	2890	2720 2550 2400		
-25	3500	2920	2750 2590 2430		
-20	3530	2950	2780 2620 2460		
-15	3570	2990	2820 2650 2490		
-10	3600	3020	2850 2680 2520		
-5	3640	3050	2880 2720 2560		
0	3680	3090	2920 2750 2590		
5	3710	3120	2950 2790 2620		
10	3750	3160	2990 2820 2660		
15	3780	3190	3020 2850 2690		
20	3820	3230	3050 2890 2720		
25	3860	3260	3090 2920 2760		
30	3890	3300	3120 2950 2790		
33	3920	3330	3150 2980 2810		

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS			VAPP = 98 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3290	2720	2560 2400 2240		
-30	3320	2750	2590 2430 2270		
-25	3350	2780	2620 2450 2300		
-20	3390	2810	2650 2490 2330		
-15	3420	2840	2680 2520 2360		
-10	3450	2880	2710 2550 2390		
-5	3480	2910	2740 2580 2420		
0	3520	2940	2770 2610 2450		
5	3550	2970	2800 2640 2480		
10	3580	3000	2840 2670 2510		
15	3620	3040	2870 2700 2540		
20	3650	3070	2900 2730 2570		
25	3690	3100	2930 2770 2610		
30	3720	3140	2960 2800 2640		
33	3750	3160	2990 2820 2660		

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.  
4-359-01-00

Figure 4-47 (Sheet 22)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
11,000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4500	3850	3660	3470	3290
-30	4550	3900	3710	3520	3340
-25	4600	3950	3760	3570	3390
-20	4660	4000	3810	3620	3440
-15	4710	4060	3860	3670	3490
-10	4770	4110	3910	3720	3540
-5	4820	4160	3970	3780	3590
0	4880	4220	4020	3830	3640
2	4900	4240	4040	3850	3660

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4300	3660	3480	3290	3120
-30	4350	3710	3520	3340	3160
-25	4400	3760	3570	3390	3210
-20	4450	3810	3620	3430	3250
-15	4500	3860	3670	3480	3300
-10	4550	3900	3710	3530	3350
-5	4600	3950	3760	3570	3390
0	4650	4000	3810	3620	3440
5	4710	4050	3860	3670	3490
10	4760	4100	3910	3720	3530
13	4790	4130	3940	3750	3560

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4280	3640	3450	3270	3100
-30	4320	3690	3500	3320	3140
-25	4370	3740	3550	3360	3180
-20	4420	3780	3590	3410	3230
-15	4470	3830	3640	3460	3280
-10	4530	3880	3690	3500	3320
-5	4580	3930	3740	3550	3370
0	4630	3980	3790	3600	3420
5	4680	4030	3840	3650	3460
10	4730	4080	3880	3690	3510
14	4770	4120	3920	3730	3550

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4230	3600	3410	3230	3050
-30	4280	3640	3460	3280	3100
-25	4330	3690	3500	3320	3140
-20	4380	3740	3550	3370	3190
-15	4430	3790	3600	3410	3230
-10	4470	3830	3640	3460	3280
-5	4530	3880	3690	3510	3320
0	4580	3930	3740	3550	3370
5	4630	3980	3790	3600	3420
10	4680	4030	3830	3650	3460
15	4730	4070	3880	3690	3510
16	4740	4080	3890	3700	3520

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4180	3550	3370	3190	3010
-30	4230	3600	3410	3230	3060
-25	4280	3640	3460	3280	3100
-20	4330	3690	3500	3320	3140
-15	4380	3740	3550	3370	3190
-10	4420	3790	3600	3410	3230
-5	4470	3830	3640	3460	3280
0	4520	3880	3690	3500	3320
5	4570	3930	3740	3550	3370
10	4620	3980	3780	3600	3410
15	4670	4020	3830	3640	3460
19	4710	4060	3870	3680	3500

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS	20 KTS	30 KTS
-35	4140	3510	3330	3150	2970
-30	4180	3550	3370	3190	3020
-25	4230	3600	3410	3230	3060
-20	4280	3650	3460	3280	3100
-15	4330	3690	3500	3320	3150
-10	4370	3740	3550	3370	3190
-5	4420	3780	3600	3410	3230
0	4470	3830	3640	3460	3280
5	4520	3880	3690	3500	3320
10	4570	3920	3730	3550	3370
15	4620	3970	3780	3590	3410
20	4670	4020	3830	3640	3460
21	4680	4030	3840	3650	3460

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

11-0000-01-00

Figure 4-47 (Sheet 23)



## LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
11,000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS					
VREF = 106 KIAS		VAPP = 113 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	4070	3440	3260	3080	2910
-30	4110	3490	3300	3130	2950
-25	4160	3530	3350	3170	2990
-20	4200	3580	3390	3210	3040
-15	4250	3620	3440	3250	3080
-10	4300	3670	3480	3300	3120
-5	4340	3710	3520	3340	3160
0	4390	3760	3570	3390	3210
5	4440	3800	3610	3430	3250
10	4490	3850	3660	3470	3290
15	4530	3890	3700	3520	3340
20	4580	3940	3750	3560	3380
24	4620	3970	3780	3600	3420

WEIGHT = 10000 POUNDS					
VREF = 104 KIAS		VAPP = 110 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3950	3330	3150	2980	2810
-30	3990	3370	3190	3020	2850
-25	4040	3420	3230	3060	2890
-20	4080	3460	3280	3100	2930
-15	4120	3500	3320	3140	2970
-10	4170	3540	3360	3180	3010
-5	4210	3590	3400	3220	3050
0	4260	3630	3450	3270	3090
5	4300	3670	3490	3310	3130
10	4350	3720	3530	3350	3170
15	4390	3760	3570	3390	3210
20	4440	3800	3620	3430	3260
25	4490	3850	3660	3480	3300
29	4520	3880	3690	3510	3330

WEIGHT = 9500 POUNDS					
VREF = 101 KIAS		VAPP = 108 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3830	3220	3040	2870	2700
-30	3870	3260	3080	2910	2740
-25	3910	3300	3120	2950	2780
-20	3950	3340	3160	2990	2820
-15	4000	3380	3200	3020	2850
-10	4040	3420	3240	3060	2890
-5	4080	3460	3280	3100	2930
0	4120	3500	3320	3140	2970
5	4170	3540	3360	3180	3010
10	4210	3590	3400	3220	3050
15	4250	3630	3440	3260	3090
20	4300	3670	3480	3300	3130
25	4340	3710	3530	3340	3170
30	4380	3750	3570	3380	3210
31	4400	3770	3580	3400	3220

WEIGHT = 9000 POUNDS					
VREF = 99 KIAS		VAPP = 105 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3710	3110	2930	2760	2590
-30	3750	3140	2970	2800	2630
-25	3790	3180	3000	2830	2670
-20	3820	3220	3040	2870	2700
-15	3860	3260	3080	2910	2740
-10	3900	3290	3120	2940	2770
-5	3940	3330	3150	2980	2810
0	3980	3370	3190	3020	2850
5	4030	3410	3230	3060	2890
10	4070	3450	3270	3090	2920
15	4110	3490	3310	3130	2960
20	4150	3530	3350	3170	3000
25	4190	3570	3390	3210	3040
30	4230	3610	3430	3250	3070
31	4240	3620	3440	3260	3090

WEIGHT = 8500 POUNDS					
VREF = 96 KIAS		VAPP = 102 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3590	2990	2820	2650	2480
-30	3620	3020	2850	2680	2520
-25	3650	3060	2880	2710	2550
-20	3690	3090	2920	2750	2580
-15	3730	3130	2950	2780	2620
-10	3770	3160	2990	2820	2650
-5	3800	3200	3020	2850	2690
0	3840	3240	3060	2890	2720
5	3880	3270	3100	2930	2760
10	3920	3310	3130	2960	2790
15	3960	3350	3170	3000	2830
20	4000	3390	3210	3030	2860
25	4030	3420	3240	3070	2900
30	4070	3460	3280	3110	2940
31	4090	3470	3290	3120	2950

WEIGHT = 8000 POUNDS					
VREF = 93 KIAS		VAPP = 98 KIAS			
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3440	2850	2680	2510	2350
-30	3470	2880	2710	2540	2380
-25	3500	2910	2740	2580	2410
-20	3530	2950	2770	2610	2450
-15	3570	2980	2810	2640	2480
-10	3600	3010	2840	2670	2510
-5	3640	3050	2870	2710	2540
0	3670	3080	2910	2740	2580
5	3710	3110	2940	2770	2610
10	3750	3150	2980	2810	2640
15	3780	3180	3010	2840	2670
20	3820	3220	3040	2870	2710
25	3850	3250	3080	2910	2740
30	3890	3290	3110	2940	2770
31	3900	3300	3120	2950	2780

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

4-361-01-00

Figure 4-47 (Sheet 24)



# LANDING DISTANCE - FEET

FLAPS - LAND  
12,000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4700	4040	3840	3650	3460
-30	4760	4090	3890	3700	3510
-25	4820	4150	3950	3750	3560
-20	4870	4200	4000	3810	3620
-15	4930	4260	4060	3860	3670
-10	4990	4310	4110	3910	3720
-5	5050	4370	4170	3970	3780
-4	5060	4380	4180	3980	3790

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4500	3840	3650	3460	3280
-30	4550	3890	3700	3510	3320
-25	4600	3940	3750	3560	3370
-20	4650	3990	3800	3610	3420
-15	4710	4040	3850	3660	3470
-10	4760	4100	3900	3710	3520
-5	4820	4150	3950	3760	3570
0	4870	4200	4000	3810	3620
5	4930	4250	4050	3860	3670
7	4950	4270	4070	3880	3690

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4470	3820	3630	3440	3250
-30	4520	3870	3670	3480	3300
-25	4570	3920	3720	3530	3350
-20	4630	3970	3770	3580	3400
-15	4680	4020	3820	3630	3450
-10	4730	4070	3870	3680	3500
-5	4790	4120	3920	3730	3540
0	4840	4170	3980	3780	3590
5	4900	4230	4030	3830	3640
8	4930	4260	4060	3860	3670

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4420	3770	3580	3390	3210
-30	4470	3820	3630	3440	3260
-25	4520	3870	3680	3490	3300
-20	4580	3920	3730	3540	3350
-15	4630	3970	3780	3590	3400
-10	4680	4020	3820	3630	3450
-5	4730	4070	3870	3680	3500
0	4790	4120	3930	3730	3550
5	4840	4170	3980	3780	3590
10	4900	4230	4030	3830	3640
11	4910	4240	4040	3840	3650

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4370	3730	3540	3350	3170
-30	4420	3770	3580	3390	3210
-25	4470	3820	3630	3440	3260
-20	4520	3870	3680	3490	3310
-15	4580	3920	3730	3540	3350
-10	4630	3970	3780	3590	3400
-5	4680	4020	3820	3630	3450
0	4730	4070	3870	3680	3500
5	4790	4120	3920	3730	3540
10	4840	4170	3970	3780	3590
14	4880	4210	4010	3820	3630

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4330	3680	3490	3310	3130
-30	4370	3730	3540	3350	3170
-25	4420	3770	3580	3400	3210
-20	4470	3820	3630	3440	3260
-15	4520	3870	3680	3490	3310
-10	4570	3920	3730	3540	3350
-5	4630	3970	3770	3590	3400
0	4680	4020	3820	3630	3450
5	4730	4070	3870	3680	3490
10	4780	4120	3920	3730	3540
15	4830	4170	3970	3780	3590
16	4840	4180	3980	3790	3600

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

11-01-00

Figure 4-47 (Sheet 25)



# MODEL 525A

## SECTION IV - PERFORMANCE APPROACH AND LANDING

LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
12.000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	4250	3610	3420 3240 3060		
-30	4300	3650	3470 3280 3100		
-25	4350	3700	3510 3330 3150		
-20	4390	3750	3560 3370 3190		
-15	4440	3800	3600 3420 3240		
-10	4490	3840	3650 3460 3280		
-5	4540	3890	3700 3510 3330		
0	4590	3940	3750 3560 3370		
5	4650	3990	3790 3600 3420		
10	4700	4040	3840 3650 3470		
15	4750	4080	3890 3700 3510		
20	4800	4130	3940 3740 3560		

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	4130	3490	3310 3130 2950		
-30	4170	3540	3350 3170 2990		
-25	4220	3580	3390 3210 3030		
-20	4260	3620	3440 3250 3080		
-15	4310	3670	3480 3300 3120		
-10	4360	3710	3530 3340 3160		
-5	4410	3760	3570 3390 3210		
0	4450	3810	3620 3430 3250		
5	4500	3850	3660 3480 3290		
10	4550	3900	3710 3520 3340		
15	4600	3950	3750 3560 3380		
20	4650	3990	3800 3610 3430		
25	4700	4040	3840 3650 3470		

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	4000	3380	3190 3010 2840		
-30	4040	3420	3230 3050 2880		
-25	4090	3460	3270 3090 2920		
-20	4130	3500	3310 3130 2960		
-15	4180	3540	3360 3180 3000		
-10	4220	3590	3400 3220 3040		
-5	4270	3630	3440 3260 3080		
0	4310	3670	3490 3300 3120		
5	4360	3720	3530 3350 3170		
10	4400	3760	3570 3390 3210		
15	4450	3810	3620 3430 3250		
20	4500	3850	3660 3470 3290		
25	4540	3890	3700 3510 3330		
29	4580	3930	3740 3550 3370		

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3870	3250	3070 2900 2730		
-30	3910	3290	3110 2930 2760		
-25	3950	3330	3150 2970 2800		
-20	4000	3370	3190 3010 2840		
-15	4040	3410	3230 3050 2880		
-10	4080	3450	3270 3090 2920		
-5	4120	3490	3310 3130 2960		
0	4170	3540	3350 3170 3000		
5	4210	3580	3390 3210 3040		
10	4250	3620	3430 3250 3070		
15	4300	3660	3470 3290 3110		
20	4340	3700	3510 3330 3150		
25	4380	3740	3560 3370 3190		
29	4420	3780	3590 3410 3230		

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3740	3130	2950 2780 2610		
-30	3780	3160	2990 2810 2640		
-25	3820	3200	3020 2850 2680		
-20	3850	3240	3060 2880 2710		
-15	3890	3280	3100 2920 2750		
-10	3930	3310	3130 2960 2790		
-5	3970	3350	3170 3000 2830		
0	4010	3390	3210 3030 2860		
5	4060	3430	3250 3070 2900		
10	4100	3470	3290 3110 2940		
15	4140	3510	3330 3150 2970		
20	4180	3550	3370 3190 3010		
25	4220	3590	3400 3220 3050		
29	4260	3630	3440 3260 3080		

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS 10 KTS 20 KTS 30 KTS		
-35	3590	2980	2810 2640 2470		
-30	3620	3010	2840 2670 2500		
-25	3650	3050	2870 2700 2540		
-20	3690	3080	2910 2740 2570		
-15	3730	3120	2940 2770 2600		
-10	3760	3150	2980 2810 2640		
-5	3800	3190	3010 2840 2670		
0	3840	3230	3050 2880 2710		
5	3880	3260	3090 2910 2740		
10	3910	3300	3120 2950 2780		
15	3950	3340	3160 2980 2810		
20	3990	3370	3190 3020 2850		
25	4030	3410	3230 3050 2880		
29	4060	3440	3260 3090 2910		

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

2025-01-05

Figure 4-47 (Sheet 26)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
13.000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	4920	4230	4030	3830	3640
-30	4980	4290	4090	3890	3690
-25	5040	4350	4140	3940	3750
-20	5100	4410	4200	4000	3800
-15	5160	4470	4260	4060	3860
-10	5220	4520	4320	4110	3920

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	4700	4030	3830	3630	3440
-30	4750	4080	3880	3680	3490
-25	4810	4130	3930	3740	3550
-20	4870	4190	3980	3790	3600
-15	4920	4240	4040	3840	3650
-10	4980	4300	4090	3890	3700
-5	5040	4350	4150	3950	3750
0	5100	4410	4200	4000	3810
1	5110	4420	4210	4010	3820

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	4680	4000	3800	3610	3420
-30	4730	4050	3850	3660	3470
-25	4780	4110	3910	3710	3520
-20	4840	4160	3960	3760	3570
-15	4900	4220	4010	3820	3630
-10	4950	4270	4070	3870	3680
-5	5010	4320	4120	3920	3730
0	5070	4380	4180	3980	3780
2	5090	4400	4200	4000	3800

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	4620	3950	3760	3560	3380
-30	4680	4000	3810	3610	3420
-25	4730	4060	3860	3660	3470
-20	4790	4110	3910	3720	3520
-15	4840	4160	3960	3770	3580
-10	4900	4220	4020	3820	3630
-5	4950	4270	4070	3870	3680
0	5010	4330	4120	3920	3730
5	5070	4380	4180	3980	3780

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	4570	3910	3710	3520	3330
-30	4620	3950	3760	3570	3380
-25	4680	4010	3810	3620	3430
-20	4730	4060	3860	3670	3480
-15	4790	4110	3910	3720	3530
-10	4840	4160	3960	3770	3580
-5	4900	4220	4020	3820	3630
0	4950	4270	4070	3870	3680
5	5010	4320	4120	3920	3730
8	5040	4360	4150	3950	3760

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	20 KTS	30 KTS
-35	4520	3860	3660	3470	3280
-30	4570	3910	3710	3520	3330
-25	4620	3960	3760	3570	3380
-20	4680	4010	3810	3620	3430
-15	4730	4060	3860	3670	3480
-10	4790	4110	3910	3720	3530
-5	4840	4160	3960	3770	3580
0	4890	4220	4010	3820	3630
5	4950	4270	4070	3870	3680
10	5000	4320	4120	3920	3730

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 27)



LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
13,000 FEETCONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEETANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-35	4440	3780	3590	3400	3220
-30	4490	3830	3640	3450	3260
-25	4540	3880	3680	3490	3310
-20	4600	3930	3730	3540	3360
-15	4650	3980	3780	3590	3400
-10	4700	4030	3830	3640	3450
-5	4750	4080	3880	3690	3500
0	4810	4130	3930	3740	3550
5	4860	4180	3980	3790	3600
10	4910	4230	4030	3840	3650
15	4970	4290	4080	3890	3690

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-35	4310	3660	3470	3280	3100
-30	4360	3700	3510	3330	3140
-25	4410	3750	3560	3370	3190
-20	4460	3800	3610	3420	3230
-15	4510	3850	3650	3460	3280
-10	4560	3900	3700	3510	3330
-5	4610	3940	3750	3560	3370
0	4660	3990	3800	3600	3420
5	4710	4040	3840	3650	3460
10	4760	4090	3890	3700	3510
15	4810	4140	3940	3750	3560
20	4860	4190	3990	3790	3600
21	4870	4200	4000	3800	3610

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-35	4180	3540	3350	3160	2980
-30	4220	3580	3390	3200	3020
-25	4270	3620	3430	3250	3070
-20	4320	3670	3480	3290	3110
-15	4370	3710	3520	3340	3150
-10	4410	3760	3570	3380	3200
-5	4460	3810	3610	3420	3240
0	4510	3850	3660	3470	3290
5	4560	3900	3700	3510	3330
10	4610	3940	3750	3560	3370
15	4650	3990	3800	3600	3420
20	4700	4040	3840	3650	3460
25	4750	4080	3890	3690	3510
26	4760	4090	3900	3700	3510

WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-35	4050	3410	3220	3040	2860
-30	4090	3450	3260	3080	2900
-25	4130	3490	3300	3120	2940
-20	4170	3530	3340	3160	2980
-15	4220	3580	3390	3200	3030
-10	4260	3620	3430	3250	3070
-5	4310	3660	3470	3290	3110
0	4360	3710	3520	3330	3150
5	4400	3750	3560	3370	3190
10	4450	3790	3600	3420	3230
15	4490	3840	3650	3460	3280
20	4540	3880	3690	3500	3320
25	4590	3930	3730	3540	3360
27	4610	3950	3750	3560	3380

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-35	3910	3280	3090	2910	2740
-30	3940	3310	3130	2950	2780
-25	3980	3350	3170	2990	2810
-20	4020	3390	3210	3030	2850
-15	4070	3430	3250	3070	2890
-10	4110	3470	3290	3110	2930
-5	4150	3510	3330	3150	2970
0	4200	3560	3370	3190	3010
5	4240	3600	3410	3230	3050
10	4280	3640	3450	3270	3090
15	4330	3680	3490	3310	3130
20	4370	3720	3530	3350	3170
25	4410	3760	3570	3390	3210
27	4430	3780	3590	3410	3220

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS 30 KTS	
-35	3740	3120	2940	2770	2600
-30	3780	3160	2970	2800	2630
-25	3810	3190	3010	2840	2660
-20	3850	3230	3050	2870	2700
-15	3890	3270	3090	2910	2740
-10	3930	3300	3120	2940	2770
-5	3970	3340	3160	2980	2810
0	4010	3380	3200	3020	2850
5	4050	3420	3240	3060	2880
10	4090	3460	3280	3100	2920
15	4130	3500	3310	3130	2960
20	4170	3540	3350	3170	2990
25	4210	3580	3390	3210	3030
27	4230	3590	3410	3230	3050

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

4-365-01-03

Figure 4-47 (Sheet 28)



# LANDING DISTANCE - FEET ACTUAL DISTANCE

FLAPS - LAND  
14,000 FEET

CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET

ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO

SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.

* WEIGHT = 12375 POUNDS					
VREF = 115 KIAS			VAPP = 122 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	5150	4440	4230	4030	3830
-30	5210	4500	4290	4080	3880
-25	5270	4560	4350	4140	3940
-20	5340	4620	4410	4200	4000
-16	5390	4670	4460	4250	4050

WEIGHT = 11500 POUNDS					
VREF = 111 KIAS			VAPP = 118 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4910	4220	4010	3810	3620
-30	4970	4280	4070	3870	3670
-25	5030	4330	4130	3920	3730
-20	5090	4390	4180	3980	3780
-15	5150	4450	4240	4040	3840
-10	5210	4510	4300	4090	3890
-5	5270	4570	4360	4150	3950

WEIGHT = 11400 POUNDS					
VREF = 111 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4890	4190	3990	3790	3600
-30	4940	4250	4040	3840	3650
-25	5000	4310	4100	3900	3700
-20	5060	4360	4160	3950	3760
-15	5120	4420	4210	4010	3810
-10	5180	4480	4270	4070	3870
-5	5240	4540	4330	4120	3920
-4	5260	4550	4340	4130	3930

WEIGHT = 11200 POUNDS					
VREF = 110 KIAS			VAPP = 117 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4830	4140	3940	3740	3550
-30	4890	4200	3990	3790	3600
-25	4950	4250	4050	3850	3650
-20	5010	4310	4100	3900	3710
-15	5070	4370	4160	3960	3760
-10	5120	4420	4220	4010	3810
-5	5180	4480	4270	4070	3870
0	5230	4530	4320	4110	3910

WEIGHT = 11000 POUNDS					
VREF = 109 KIAS			VAPP = 115 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4780	4090	3890	3690	3500
-30	4830	4150	3940	3740	3550
-25	4890	4200	4000	3800	3600
-20	4950	4260	4050	3850	3660
-15	5010	4310	4110	3910	3710
-10	5070	4370	4160	3960	3760
-5	5120	4420	4220	4010	3820
0	5180	4480	4270	4070	3870
2	5210	4500	4290	4090	3890

WEIGHT = 10800 POUNDS					
VREF = 108 KIAS			VAPP = 114 KIAS		
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	10 KTS	HEADWINDS 20 KTS	30 KTS
-35	4720	4040	3840	3640	3450
-30	4780	4090	3890	3690	3500
-25	4830	4150	3940	3750	3550
-20	4890	4200	4000	3800	3610
-15	4950	4260	4050	3850	3660
-10	5010	4310	4110	3910	3710
-5	5060	4370	4160	3960	3760
0	5120	4420	4220	4010	3810
4	5170	4470	4260	4060	3860

TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-47 (Sheet 29)



# MODEL 525A

## SECTION IV - PERFORMANCE APPROACH AND LANDING

### LANDING DISTANCE - FEET ACTUAL DISTANCE

**FLAPS - LAND  
14,000 FEET**

**CONDITIONS: LANDING GEAR - DOWN  
GROUND FLAPS - AFTER TOUCHDOWN  
AIRSPEED - VREF AT 50 FEET**

**ANTI-ICE SYSTEMS - ON OR OFF  
THRUST - IDLE AT 50 FEET  
THRUST ATTENUATORS - AUTO**

**SOME CONDITIONS MAY BE BRAKE ENERGY OR CLIMB LIMITED. OBTAIN ALLOWABLE WEIGHT FROM MAXIMUM LANDING WEIGHT TABLES.**

WEIGHT = 10500 POUNDS VREF = 106 KIAS VAPP = 113 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	4640	3960	3760	3570	3380
-30	4700	4010	3810	3620	3430
-25	4750	4070	3870	3670	3480
-20	4800	4120	3920	3720	3530
-15	4860	4170	3970	3770	3580
-10	4920	4230	4020	3820	3630
-5	4970	4280	4080	3880	3680
0	5030	4330	4130	3930	3730
5	5090	4390	4180	3980	3780
9	5130	4430	4230	4020	3820

WEIGHT = 10000 POUNDS VREF = 104 KIAS VAPP = 110 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	4510	3830	3640	3440	3260
-30	4560	3880	3680	3490	3300
-25	4610	3930	3730	3540	3350
-20	4660	3980	3780	3590	3400
-15	4710	4030	3830	3640	3450
-10	4770	4080	3880	3690	3500
-5	4820	4140	3930	3740	3550
0	4870	4190	3990	3790	3590
5	4930	4240	4040	3840	3640
10	4980	4290	4090	3890	3690
15	5040	4340	4140	3940	3740
16	5050	4350	4150	3950	3750

WEIGHT = 9500 POUNDS VREF = 101 KIAS VAPP = 108 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	4370	3700	3510	3320	3130
-30	4410	3750	3550	3360	3180
-25	4460	3800	3600	3410	3220
-20	4510	3840	3650	3460	3270
-15	4560	3890	3700	3500	3320
-10	4610	3940	3740	3550	3360
-5	4660	3990	3790	3600	3410
0	4720	4040	3840	3640	3460
5	4770	4090	3890	3690	3500
10	4820	4140	3940	3740	3550
15	4870	4190	3980	3790	3600
20	4920	4240	4030	3830	3640
22	4940	4250	4050	3850	3660


WEIGHT = 9000 POUNDS VREF = 99 KIAS VAPP = 105 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	4220	3570	3380	3190	3010
-30	4270	3610	3420	3230	3050
-25	4310	3660	3460	3280	3090
-20	4360	3700	3510	3320	3140
-15	4410	3750	3550	3360	3180
-10	4460	3790	3600	3410	3220
-5	4500	3840	3640	3450	3270
0	4550	3890	3690	3500	3310
5	4600	3930	3740	3540	3360
10	4650	3980	3780	3590	3400
15	4700	4030	3830	3630	3440
20	4750	4070	3870	3680	3490
25	4800	4120	3920	3720	3530

WEIGHT = 8500 POUNDS VREF = 96 KIAS VAPP = 102 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	4080	3430	3240	3060	2880
-30	4120	3470	3280	3100	2920
-25	4160	3510	3320	3140	2960
-20	4200	3550	3360	3180	3000
-15	4250	3600	3410	3220	3040
-10	4290	3640	3450	3260	3080
-5	4340	3680	3490	3300	3120
0	4390	3730	3540	3350	3160
5	4430	3770	3580	3390	3210
10	4480	3820	3620	3430	3250
15	4520	3860	3660	3470	3290
20	4570	3900	3710	3520	3330
25	4620	3950	3750	3560	3370

WEIGHT = 8000 POUNDS VREF = 93 KIAS VAPP = 98 KIAS					
TEMP DEG C	TAILWIND 10 KTS	ZERO WIND	HEADWINDS		
			10 KTS	20 KTS	30 KTS
-35	3900	3270	3080	2900	2730
-30	3940	3300	3120	2940	2760
-25	3980	3340	3160	2970	2800
-20	4020	3380	3190	3010	2840
-15	4060	3420	3230	3050	2880
-10	4100	3460	3270	3090	2910
-5	4150	3500	3310	3130	2950
0	4190	3540	3360	3170	2990
5	4230	3590	3400	3210	3030
10	4280	3630	3440	3250	3070
15	4320	3670	3480	3290	3110
20	4360	3710	3520	3330	3150
25	4400	3750	3560	3370	3190

**TO OBTAIN LANDING DISTANCE WITH NEGATIVE (DOWNHILL) RUNWAY GRADIENT, REFER TO LANDING PROCEDURES.**

88779-01-00

 **Figure 4-47 (Sheet 30)**



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																																					
		*12375					11500					11200					11000					10500																	
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS																	
	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30									
0	-25	5.6	6.3	6.6	6.9	7.3	6.7	7.6	8.0	8.4	8.9	7.1	8.1	8.5	9.0	9.4	7.4	8.5	8.9	9.4	9.9	8.2	9.4	9.9	10.4	11.0	8.2	9.4	9.9	10.4	11.0								
	-20	5.6	6.3	6.6	7.0	7.3	6.7	7.7	8.0	8.4	8.9	7.2	8.2	8.5	9.0	9.4	7.5	8.5	8.9	9.4	9.9	8.3	9.4	9.9	10.4	11.0	8.3	9.4	9.9	10.4	11.0								
	-15	5.6	6.4	6.7	7.0	7.3	6.8	7.7	8.0	8.4	8.9	7.2	8.2	8.6	9.0	9.5	7.5	8.5	8.9	9.4	9.9	8.3	9.4	9.9	10.4	11.0	8.3	9.4	9.9	10.4	11.0								
	-10	5.7	6.4	6.7	7.0	7.3	6.8	7.7	8.0	8.4	8.9	7.2	8.2	8.6	9.0	9.5	7.5	8.5	8.9	9.4	9.9	8.3	9.5	9.9	10.4	11.0	8.3	9.5	9.9	10.4	11.0								
	-5	5.7	6.4	6.7	7.0	7.3	6.8	7.7	8.1	8.4	8.9	7.2	8.2	8.6	9.0	9.5	7.5	8.6	9.0	9.4	9.9	8.3	9.5	9.9	10.4	11.0	8.3	9.5	9.9	10.4	11.0								
	0	5.7	6.4	6.7	7.0	7.3	6.8	7.7	8.1	8.5	8.9	7.3	8.2	8.6	9.0	9.5	7.6	8.6	9.0	9.4	9.9	8.4	9.5	10.0	10.5	11.0	8.4	9.5	10.0	10.5	11.0								
	5	5.7	6.4	6.7	7.0	7.4	6.9	7.7	8.1	8.5	8.9	7.3	8.2	8.6	9.0	9.5	7.6	8.6	9.0	9.4	9.9	8.4	9.5	10.0	10.5	11.0	8.4	9.5	10.0	10.5	11.0								
	10	5.7	6.5	6.7	7.0	7.4	6.9	7.8	8.1	8.5	8.9	7.3	8.3	8.6	9.1	9.5	7.6	8.6	9.0	9.4	9.9	8.4	9.5	10.0	10.5	11.0	8.4	9.5	10.0	10.5	11.0								
	15	5.8	6.5	6.8	7.1	7.4	6.9	7.8	8.1	8.5	8.9	7.3	8.3	8.7	9.1	9.5	7.6	8.6	9.0	9.5	9.9	8.4	9.6	10.0	10.5	11.0	8.4	9.6	10.0	10.5	11.0								
	20	5.8	6.5	6.8	7.1	7.4	6.9	7.8	8.2	8.5	8.9	7.4	8.3	8.7	9.1	9.5	7.7	8.7	9.1	9.5	9.9	8.5	9.6	10.0	10.5	11.1	8.5	9.6	10.0	10.5	11.1								
10	25	5.5	6.2	6.4	6.7	7.0	6.6	7.5	7.8	8.1	8.5	7.1	8.0	8.3	8.7	9.1	7.4	8.3	8.7	9.1	9.5	8.2	9.2	9.6	10.1	10.6	8.2	9.2	9.6	10.1	10.6								
	30	4.7	5.3	5.5	5.8	6.0	5.8	6.5	6.8	7.1	7.5	6.2	7.0	7.3	7.6	8.0	6.5	7.3	7.7	8.0	8.4	7.3	8.2	8.6	9.0	9.4	7.3	8.2	8.6	9.0	9.4								
	35	4.0	4.5	4.6	4.8	5.0	5.0	5.6	5.8	6.1	6.4	5.4	6.1	6.3	6.6	6.9	5.7	6.4	6.6	6.9	7.3	6.4	7.2	7.5	7.9	8.2	6.4	7.2	7.5	7.9	8.2								
	40	3.2	3.6	3.7	3.9	4.0	4.2	4.7	4.9	5.1	5.3	4.5	5.1	5.3	5.5	5.8	4.8	5.4	5.6	5.9	6.1	5.4	6.1	6.4	6.7	7.0	5.4	6.1	6.4	6.7	7.0								
	45	2.4	2.7	2.8	2.9	3.0	3.3	3.7	3.9	4.0	4.2	3.7	4.1	4.3	4.5	4.7	3.9	4.4	4.6	4.8	5.0	4.5	5.1	5.3	5.6	5.8	4.5	5.1	5.3	5.6	5.8								
	50	1.7	1.8	1.9	2.0	2.1	2.5	2.8	2.9	3.0	3.2	2.8	3.2	3.3	3.4	3.6	3.0	3.4	3.6	3.7	3.9	3.6	4.1	4.3	4.5	4.7	3.6	4.1	4.3	4.5	4.7								
	55	1.0	1.1	1.1	1.2	1.2	1.8	2.0	2.1	2.1	2.2	2.1	2.3	2.4	2.5	2.6	2.3	2.6	2.7	2.8	2.9	2.8	3.2	3.3	3.5	3.6	2.8	3.2	3.3	3.5	3.6								
	60	5.5	6.2	6.5	6.8	7.1	6.6	7.5	7.9	8.2	8.7	7.0	8.0	8.4	8.8	9.2	7.3	8.3	8.7	9.2	9.7	8.1	9.3	9.7	10.2	10.8	8.1	9.3	9.7	10.2	10.8								
	65	5.5	6.2	6.5	6.8	7.1	6.6	7.5	7.9	8.2	8.7	7.0	8.0	8.4	8.8	9.2	7.3	8.3	8.7	9.2	9.7	8.1	9.3	9.7	10.2	10.8	8.1	9.3	9.7	10.2	10.8								
	70	5.5	6.2	6.5	6.8	7.1	6.6	7.5	7.9	8.2	8.7	7.1	8.0	8.4	8.8	9.3	7.4	8.4	8.8	9.2	9.7	8.2	9.3	9.7	10.2	10.8	8.2	9.3	9.7	10.2	10.8								
20	-5	5.6	6.3	6.5	6.8	7.2	6.7	7.6	7.9	8.3	8.7	7.1	8.1	8.4	8.8	9.3	7.4	8.4	8.8	9.2	9.7	8.2	9.3	9.7	10.2	10.8	8.2	9.3	9.7	10.2	10.8								
	0	5.6	6.3	6.6	6.9	7.2	6.7	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.3	7.5	8.4	8.8	9.2	9.7	8.2	9.3	9.8	10.3	10.8	8.2	9.3	9.8	10.3	10.8								
	5	5.6	6.3	6.6	6.9	7.2	6.8	7.6	8.0	8.3	8.7	7.2	8.1	8.5	8.9	9.3	7.5	8.5	8.8	9.3	9.7	8.3	9.4	9.8	10.3	10.8	8.3	9.4	9.8	10.3	10.8								
	10	5.6	6.3	6.6	6.9	7.2	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.5	8.9	9.3	7.5	8.5	8.8	9.2	9.7	8.3	9.4	9.8	10.3	10.8	8.3	9.4	9.8	10.3	10.8								
	15	5.5	6.2	6.5	6.7	7.0	6.7	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.1	7.4	8.3	8.7	9.1	9.5	8.2	9.2	9.7	10.1	10.6	8.2	9.2	9.7	10.1	10.6								
	20	5.3	5.9	6.2	6.5	6.7	6.4	7.2	7.5	7.9	8.2	6.8	7.7	8.0	8.4	8.8	7.1	8.0	8.4	8.8	9.2	7.9	8.9	9.3	9.8	10.2	7.9	8.9	9.3	9.8	10.2								
	25	4.9	5.5	5.7	5.9	6.2	6.0	6.7	7.0	7.3	7.6	6.4	7.2	7.5	7.8	8.2	6.7	7.5	7.8	8.2	8.6	7.4	8.4	8.7	9.1	9.6	7.4	8.4	8.7	9.1	9.6								
	30	4.2	4.7	4.9	5.1	5.3	5.2	5.9	6.1	6.4	6.7	5.6	6.3	6.6	6.9	7.2	5.9	6.6	6.9	7.2	7.6	6.6	7.5	7.8	8.2	8.5	6.6	7.5	7.8	8.2	8.5								
	35	3.5	3.9	4.1	4.2	4.4	4.5	5.0	5.2	5.4	5.7	4.8	5.4	5.7	5.9	6.2	5.1	5.7	6.0	6.2	6.5	5.8	6.5	6.8	7.1	7.5	5.8	6.5	6.8	7.1	7.5								
	40	2.7	3.0	3.1	3.3	3.4	3.6	4.1	4.2	4.4	4.6	4.0	4.5	4.7	4.9	5.1	4.2	4.7	5.0	5.2	5.4	4.9	5.5	5.7	6.0	6.3	4.9	5.5	5.7	6.0	6.3								
45	1.9	2.2	2.2	2.3	2.4	2.8	3.1	3.3	3.4	3.6	3.1	3.5	3.7	3.8	4.0	3.4	3.8	3.9	4.1	4.3	4.0	4.0	4.5	4.7	4.9	5.1	4.0	4.5	4.7	4.9	5.1								
30	50	1.2	1.3	1.4	1.5	1.5	2.0	2.3	2.4	2.5	2.6	2.3	2.6	2.7	2.8	3.0	2.6	2.9	3.0	3.1	3.3	3.1	3.5	3.7	3.8	4.0	3.1	3.5	3.7	3.8	4.0								
	52	.8	.9	1.0	1.0	1.0	1.6	1.8	1.9	2.0	2.0	1.9	2.1	2.2	2.3	2.4	2.1	2.4	2.5	2.6	2.7	2.7	3.0	3.1	3.3	3.4	2.7	3.0	3.1	3.3	3.4								
	54	5.4	6.1	6.4	6.7	7.0	6.5	7.4	7.8	8.1	8.5	7.0	7.9	8.3	8.7	9.1	7.3	8.2	8.6	9.1	9.5	8.0	9.2	9.6	10.1	10.6	8.0	9.2	9.6	10.1	10.6								
	-20	5.4	6.1	6.4	6.7	7.0	6.6	7.4	7.8	8.1	8.5	7.0	7.9	8.3	8.7	9.1	7.3	8.3	8.6	9.1	9.5	8.1	9.2	9.6	10.1	10.6	8.1	9.2	9.6	10.1	10.6								
	-15	5.5	6.2	6.4	6.7	7.0	6.6	7.4	7.8	8.1	8.5	7.0	7.9	8.3	8.7	9.1	7.3	8.3	8.6	9.1	9.5	8.1	9.2	9.6	10.1	10.6	8.1	9.2	9.6	10.1	10.6								
	-10	5.5	6.2	6.4	6.7	7.0	6.6	7.5	7.8	8.2	8.6	7.0	8.0	8.3	8.7	9.1	7.3	8.3	8.7	9.1	9.5	8.1	9.2	9.6	10.1	10.6	8.1	9.2	9.6	10.1	10.6								
	-5	5.5	6.2	6.5	6.7	7.1	6.6	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.2	7.4	8.3	8.7	9.1	9.6	8.2	9.2	9.7	10.1	10.6	8.2	9.2	9.7	10.1	10.6								
	0	5.5	6.2	6.5	6.8	7.1	6.7	7.5	7.8	8.2	8.6	7.1	8.0	8.4	8.7	9.2	7.4	8.3	8.7	9.1	9.6	8.2	9.3	9.7	10.2	10.7	8.2	9.3	9.7	10.2	10.7								
	5	5.6	6.2	6.5	6.8	7.1	6.7	7.5	7.9	8.2	8.6	7.1	8.0	8.4	8.8	9.2	7.4	8.4	8.7	9.1	9.6	8.2	9.3	9.7	10.2	10.7	8.2	9.3	9.7	10.2	10.7								
	10	5.6	6.3	6.5	6.8	7.1	6.7	7.6	7.9	8.2	8.6	7.2	8.0	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.2	9.3	9.7	10.2	10.7	8.2	9.3	9.7	10.2	10.7								
15	5.3	5.9	6.2	6.4	6.7	6.4	7.2	7.5	7.8	8.2	6.8	7.7	8.0	8.4	8.8	7.1	8.0	8.4	8.7	9.2	7.9	8.9	9.3	9.7	10.2	7.9	8.9	9.3	9.7	10.2									
40	20	4.9	5.4	5.7	5.9	6.2	6.0	6.7	7.0	7.3	7.6	6.4	7.1	7.5	7.8	8.1	6.6	7.5	7.8	8.1	8.5	7.4	8.3	8.7	9.1	9.6	7.4	8.3	8.7	9.1	9.6								
	25	4.3	4.8	5.0	5.2	5.5	5.4	6.0	6.3	6.5	6.8	5.8	6.5	6.7	7.0	7.4	6.0	6.8	7.1	7.4	7.7	6.8	7.6	7.9	8.3	8.7	6.8	7.6	7.9	8.3	8.7								
	30	3.7	4.2	4.3	4.5	4.7	4.7	5																															



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																								
		10000					9500					9000					8500					8000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-25	9.1	10.4	11.0	11.6	12.2	10.1	11.6	12.2	12.9	13.6	11.1	12.8	13.5	14.3	15.2	12.3	14.2	15.0	15.9	17.0	13.6	15.8	16.8	17.8	19.0
	-20	9.1	10.4	11.0	11.6	12.2	10.1	11.6	12.2	12.9	13.6	11.1	12.8	13.5	14.3	15.2	12.3	14.3	15.1	15.9	16.9	13.6	15.9	16.8	17.8	19.0
	-15	9.1	10.5	11.0	11.6	12.2	10.1	11.6	12.2	12.9	13.6	11.2	12.9	13.5	14.3	15.2	12.4	14.3	15.1	15.9	16.9	13.7	15.9	16.8	17.8	19.0
	-10	9.2	10.5	11.0	11.6	12.2	10.1	11.6	12.2	12.9	13.6	11.2	12.9	13.6	14.3	15.2	12.4	14.3	15.1	16.0	16.9	13.7	15.9	16.8	17.8	19.0
	-5	9.2	10.5	11.0	11.6	12.2	10.2	11.6	12.2	12.9	13.6	11.2	12.9	13.6	14.3	15.2	12.4	14.3	15.1	16.0	16.9	13.7	15.9	16.8	17.8	19.0
	0	9.2	10.5	11.0	11.6	12.2	10.2	11.7	12.3	12.9	13.6	11.3	12.9	13.6	14.3	15.2	12.5	14.4	15.1	16.0	16.9	13.8	16.0	16.9	17.8	19.0
	5	9.3	10.6	11.1	11.6	12.2	10.2	11.7	12.3	12.9	13.6	11.3	13.0	13.6	14.4	15.2	12.5	14.4	15.2	16.0	16.9	13.8	16.0	16.9	17.9	19.0
	10	9.3	10.6	11.1	11.6	12.3	10.3	11.7	12.3	12.9	13.6	11.3	13.0	13.6	14.4	15.2	12.5	14.4	15.2	16.0	16.9	13.9	16.0	16.9	17.9	19.0
	15	9.3	10.6	11.1	11.7	12.3	10.3	11.7	12.3	12.9	13.6	11.4	13.0	13.7	14.4	15.2	12.6	14.4	15.2	16.0	16.9	13.9	16.0	16.9	17.9	19.0
	20	9.4	10.6	11.1	11.7	12.3	10.3	11.8	12.3	13.0	13.7	11.4	13.0	13.7	14.4	15.2	12.6	14.5	15.2	16.0	17.0	14.0	16.1	16.9	17.9	19.0
10	-25	9.0	10.2	10.7	11.2	11.8	10.0	11.3	11.9	12.5	13.2	11.0	12.6	13.2	13.9	14.7	12.2	14.0	14.7	15.5	16.4	13.5	15.6	16.4	17.3	18.3
	-20	8.1	9.2	9.6	10.0	10.6	9.0	10.2	10.7	11.2	11.8	10.0	11.4	12.0	12.6	13.3	11.1	12.7	13.4	14.1	14.9	12.4	14.2	15.0	15.8	16.7
	-15	7.1	8.1	8.5	8.9	9.3	8.0	9.1	9.5	10.0	10.5	9.0	10.2	10.7	11.2	11.9	10.0	11.5	12.0	12.7	13.4	11.2	12.9	13.5	14.3	15.1
	-10	6.2	7.0	7.3	7.7	8.0	7.0	7.9	8.3	8.7	9.2	7.9	9.0	9.4	9.9	10.4	8.9	10.2	10.7	11.2	11.8	10.0	11.5	12.1	12.7	13.5
	-5	5.2	5.9	6.2	6.5	6.8	6.0	6.8	7.1	7.4	7.8	6.8	7.8	8.1	8.5	9.0	7.8	8.9	9.3	9.8	10.3	8.8	10.1	10.6	11.2	11.8
	0	4.3	4.8	5.1	5.3	5.6	5.0	5.7	5.9	6.2	6.5	5.8	6.6	6.9	7.3	7.6	6.7	7.6	8.0	8.4	8.9	7.7	8.8	9.2	9.7	10.3
	5	3.5	3.9	4.1	4.3	4.5	4.1	4.7	4.9	5.1	5.4	4.9	5.5	5.8	6.1	6.4	5.7	6.5	6.8	7.2	7.5	6.6	7.6	8.0	8.4	8.8
	10	9.0	10.3	10.8	11.4	12.0	9.9	11.4	12.0	12.6	13.4	11.0	12.6	13.3	14.1	14.9	12.1	14.0	14.8	15.7	16.7	13.4	15.6	16.5	17.5	18.7
	-20	9.0	10.3	10.8	11.3	12.0	9.9	11.4	12.0	12.6	13.3	11.0	12.6	13.3	14.1	14.9	12.2	14.1	14.8	15.7	16.6	13.5	15.6	16.5	17.5	18.6
	-15	9.0	10.3	10.8	11.4	12.0	10.0	11.4	12.0	12.6	13.4	11.0	12.7	13.3	14.1	14.9	12.2	14.1	14.8	15.7	16.6	13.5	15.7	16.5	17.5	18.6
20	-10	9.0	10.3	10.8	11.4	12.0	10.0	11.4	12.0	12.7	13.4	11.1	12.7	13.4	14.1	14.9	12.2	14.1	14.9	15.7	16.6	13.6	15.7	16.6	17.5	18.6
	-5	9.1	10.3	10.8	11.4	12.0	10.0	11.5	12.0	12.7	13.4	11.1	12.7	13.4	14.1	14.9	12.3	14.1	14.9	15.7	16.6	13.6	15.7	16.6	17.6	18.6
	0	9.1	10.4	10.9	11.4	12.0	10.1	11.5	12.1	12.7	13.4	11.1	12.8	13.4	14.1	14.9	12.3	14.2	14.9	15.7	16.7	13.6	15.8	16.6	17.6	18.6
	5	9.1	10.4	10.9	11.4	12.0	10.1	11.5	12.1	12.7	13.4	11.2	12.8	13.4	14.1	14.9	12.4	14.2	14.9	15.8	16.7	13.7	15.8	16.6	17.6	18.7
	10	9.2	10.4	10.9	11.4	12.0	10.1	11.5	12.1	12.7	13.4	11.2	12.8	13.4	14.1	14.9	12.4	14.2	14.9	15.7	16.6	13.7	15.8	16.6	17.6	18.6
	15	9.0	10.2	10.7	11.2	11.8	10.0	11.4	11.9	12.5	13.2	11.1	12.6	13.2	13.9	14.7	12.2	14.0	14.7	15.5	16.4	13.5	15.6	16.4	17.3	18.4
	20	8.8	9.9	10.4	10.9	11.4	9.7	11.0	11.5	12.1	12.8	10.7	12.2	12.8	13.5	14.2	11.9	13.6	14.3	15.1	15.9	13.2	15.2	16.0	16.9	17.8
	25	8.2	9.3	9.8	10.2	10.7	9.2	10.4	10.9	11.4	12.0	10.2	11.6	12.1	12.8	13.4	11.3	12.9	13.6	14.3	15.1	12.6	14.4	15.2	16.0	16.9
	30	7.4	8.4	8.8	9.2	9.6	8.3	9.4	9.8	10.3	10.8	9.3	10.5	11.0	11.6	12.2	10.3	11.8	12.4	13.0	13.7	11.5	13.2	13.9	14.7	15.5
	35	6.5	7.4	7.7	8.1	8.5	7.4	8.4	8.7	9.2	9.6	8.3	9.4	9.9	10.4	10.9	9.3	10.6	11.1	11.7	12.4	10.5	12.0	12.6	13.3	14.0
30	-40	5.6	6.3	6.6	6.9	7.2	6.4	7.2	7.5	7.9	8.3	7.2	8.2	8.6	9.0	9.5	8.2	9.4	9.8	10.3	10.9	9.3	10.6	11.2	11.7	12.4
	-35	4.6	5.2	5.5	5.7	6.0	5.4	6.1	6.4	6.7	7.0	6.2	7.0	7.4	7.7	8.1	7.1	8.1	8.5	8.9	9.4	8.1	9.3	9.7	10.2	10.8
	-30	3.8	4.2	4.4	4.6	4.8	4.5	5.0	5.3	5.5	5.8	5.2	5.9	6.2	6.5	6.8	6.1	6.9	7.2	7.6	8.0	7.0	8.0	8.4	8.8	9.3
	-25	3.3	3.7	3.9	4.0	4.2	4.0	4.5	4.7	4.9	5.1	4.7	5.3	5.6	5.8	6.1	5.5	6.3	6.6	6.9	7.3	6.4	7.3	7.7	8.1	8.5
	-20	8.9	10.2	10.7	11.2	11.8	9.9	11.3	11.9	12.5	13.2	10.9	12.5	13.2	13.9	14.7	12.1	13.9	14.7	15.5	16.5	13.4	15.5	16.4	17.4	18.4
	-15	8.9	10.2	10.7	11.2	11.8	9.9	11.3	11.9	12.5	13.2	10.9	12.5	13.2	13.9	14.7	12.1	13.9	14.7	15.5	16.4	13.4	15.5	16.4	17.3	18.4
	-10	9.0	10.2	10.7	11.2	11.8	9.9	11.3	11.9	12.5	13.2	11.0	12.6	13.2	13.9	14.7	12.1	14.0	14.7	15.5	16.5	13.4	15.5	16.4	17.4	18.4
	-5	9.0	10.2	10.7	11.3	11.8	9.9	11.3	11.9	12.5	13.2	11.0	12.6	13.2	13.9	14.7	12.2	14.0	14.7	15.5	16.5	13.5	15.6	16.4	17.4	18.4
	0	9.0	10.2	10.7	11.3	11.9	10.0	11.4	11.9	12.5	13.2	11.0	12.6	13.3	14.0	14.7	12.2	14.0	14.8	15.6	16.5	13.5	15.6	16.4	17.4	18.4
	5	9.1	10.3	10.8	11.3	11.9	10.0	11.4	11.9	12.6	13.2	11.1	12.7	13.3	14.0	14.7	12.3	14.1	14.8	15.6	16.5	13.6	15.6	16.5	17.4	18.4
40	10	9.1	10.3	10.8	11.3	11.9	10.1	11.4	12.0	12.6	13.2	11.1	12.7	13.3	14.0	14.8	12.3	14.1	14.8	15.6	16.5	13.6	15.7	16.5	17.4	18.5
	15	8.8	9.9	10.4	10.8	11.4	9.7	11.0	11.5	12.1	12.7	10.7	12.2	12.8	13.5	14.2	11.9	13.6	14.3	15.0	15.9	13.2	15.2	15.9	16.8	17.8
	20	8.2	9.3	9.7	10.2	10.7	9.2	10.4	10.9	11.4	12.0	10.2	11.6	12.1	12.7	13.4	11.3	12.9	13.5	14.2	15.0	12.6	14.4	15.1	16.0	16.9
	25	7.6	8.5	8.9	9.3	9.8	8.4	9.6	10.0	10.5	11.0	9.4	10.7	11.2	11.8	12.4	10.5	12.0	12.6	13.2	13.9	11.7	13.4	14.1	14.8	15.7
	30	6.8	7.7	8.1	8.4	8.8	7.7	8.7	9.1	9.5	10.0	8.6	9.8	10.2	10.7	11.3	9.7	11.0	11.5	12.1	12.8	10.8	12.4	13.0	13.7	14.5
	35	5.9	6.7	7.0	7.3	7.7	6.7	7.6	8.0	8.3	8.8	7.6	8.7	9.1	9.5	10.0	8.6	9.8	10.3	10.8	11.4	9.7	11.1	11.7	12.3	12.9
	40	5.0	5.6	5.9	6.1	6.4	5.8	6.5	6.8	7.1	7.5	6.6	7.5	7.8	8.2	8.6	7.5	8.6	9.0	9.4	9.9	8.6	9.8	10.2	10.8	11.4
	45	4.1	4.6	4.8	5.0	5.2	4.8	5.4	5.6	5.9	6.2	5.6	6.3	6.6	6.9	7.3	6.4	7.3	7.7	8.0	8.5	7.4	8.5	8.9	9.3	9.8
	50	3.2	3.6	3.8	4.0	4.1	3.9	4.4																		



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15<sup>0</sup>CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		*12375					11500					11200					11000					10500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
4000	-30	5.5	6.2	6.5	6.8	7.1	6.6	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.2	7.4	8.3	8.7	9.1	9.6	8.1	9.2	9.7	10.1	10.7
	-25	5.5	6.2	6.5	6.8	7.1	6.6	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.2	7.4	8.3	8.7	9.1	9.6	8.1	9.2	9.7	10.1	10.7
	-20	5.5	6.2	6.5	6.8	7.1	6.7	7.5	7.8	8.2	8.6	7.1	8.0	8.3	8.7	9.2	7.4	8.3	8.7	9.1	9.6	8.2	9.2	9.7	10.1	10.7
	-15	5.6	6.2	6.5	6.8	7.1	6.7	7.5	7.8	8.2	8.6	7.1	8.0	8.4	8.7	9.2	7.4	8.3	8.7	9.1	9.6	8.2	9.3	9.7	10.1	10.7
	-10	5.6	6.2	6.5	6.8	7.1	6.7	7.5	7.9	8.2	8.6	7.1	8.0	8.4	8.8	9.2	7.4	8.4	8.7	9.1	9.6	8.2	9.3	9.7	10.2	10.7
	-5	5.6	6.3	6.5	6.8	7.1	6.7	7.6	7.9	8.2	8.6	7.2	8.0	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.2	9.3	9.7	10.2	10.7
	0	5.6	6.2	6.5	6.7	7.0	6.7	7.5	7.8	8.2	8.5	7.1	8.0	8.3	8.7	9.1	7.4	8.3	8.7	9.1	9.5	8.2	9.2	9.6	10.1	10.6
	5	5.2	5.8	6.1	6.3	6.6	6.3	7.1	7.4	7.7	8.1	6.7	7.6	7.9	8.2	8.6	7.0	7.9	8.2	8.6	9.0	7.8	8.8	9.2	9.6	10.1
	10	4.7	5.3	5.5	5.7	6.0	5.8	6.5	6.8	7.1	7.4	6.2	7.0	7.3	7.6	7.9	6.5	7.3	7.6	7.9	8.3	7.2	8.1	8.5	8.9	9.3
	15	4.3	4.8	5.0	5.2	5.4	5.3	5.9	6.2	6.5	6.7	5.7	6.4	6.7	6.9	7.3	6.0	6.7	7.0	7.3	7.6	6.7	7.5	7.9	8.2	8.6
5000	-30	5.5	6.2	6.5	6.8	7.1	6.7	7.5	7.9	8.2	8.6	7.1	8.0	8.4	8.8	9.2	7.4	8.4	8.8	9.2	9.6	8.2	9.3	9.7	10.2	10.7
	-25	5.5	6.2	6.5	6.8	7.1	6.7	7.5	7.9	8.2	8.6	7.1	8.0	8.4	8.8	9.2	7.4	8.4	8.7	9.2	9.6	8.2	9.3	9.7	10.2	10.7
	-20	5.6	6.2	6.5	6.8	7.1	6.7	7.5	7.9	8.2	8.6	7.1	8.0	8.4	8.8	9.2	7.4	8.4	8.7	9.2	9.6	8.2	9.3	9.7	10.2	10.7
	-15	5.6	6.2	6.5	6.8	7.1	6.7	7.6	7.9	8.2	8.6	7.2	8.0	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.2	9.3	9.7	10.2	10.7
	-10	5.5	6.1	6.4	6.6	6.9	6.6	7.4	7.7	8.1	8.4	7.0	7.9	8.2	8.6	9.0	7.3	8.2	8.6	9.0	9.4	8.1	9.1	9.6	10.0	10.5
	-5	5.4	6.0	6.2	6.5	6.8	6.5	7.3	7.6	7.9	8.3	6.9	7.7	8.1	8.4	8.8	7.2	8.1	8.4	8.8	9.2	8.0	9.0	9.4	9.8	10.3
	0	5.1	5.7	5.9	6.2	6.4	6.2	7.0	7.3	7.6	7.9	6.6	7.4	7.8	8.1	8.5	6.9	7.8	8.1	8.5	8.9	7.7	8.7	9.0	9.4	9.9
	5	4.7	5.2	5.4	5.6	5.9	5.8	6.4	6.7	7.0	7.3	6.2	6.9	7.2	7.5	7.8	6.4	7.2	7.5	7.8	8.2	7.2	8.1	8.4	8.8	9.2
	10	4.2	4.7	4.9	5.1	5.3	5.3	5.9	6.1	6.4	6.6	5.6	6.3	6.6	6.9	7.2	5.9	6.6	6.9	7.2	7.5	6.6	7.5	7.8	8.1	8.5
	15	3.8	4.2	4.4	4.5	4.7	4.8	5.3	5.6	5.8	6.0	5.2	5.8	6.0	6.3	6.5	5.4	6.1	6.3	6.6	6.9	6.1	6.9	7.2	7.5	7.8
6000	-30	5.6	6.3	6.5	6.8	7.1	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.3	7.5	8.4	8.8	9.2	9.7	8.3	9.3	9.8	10.2	10.8
	-25	5.6	6.3	6.5	6.8	7.1	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.3	9.3	9.8	10.2	10.7
	-20	5.6	6.3	6.5	6.8	7.1	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.3	9.3	9.8	10.2	10.7
	-15	5.6	6.3	6.5	6.8	7.1	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.3	9.3	9.8	10.2	10.7
	-10	5.6	6.2	6.4	6.7	7.0	6.7	7.5	7.8	8.2	8.6	7.2	8.0	8.4	8.7	9.1	7.4	8.4	8.7	9.1	9.5	8.2	9.3	9.7	10.1	10.6
	-5	5.4	6.0	6.3	6.5	6.8	6.6	7.3	7.6	8.0	8.3	7.0	7.8	8.2	8.5	8.9	7.3	8.2	8.5	8.9	9.3	8.1	9.1	9.5	9.9	10.4
	0	5.1	5.7	5.9	6.2	6.4	6.3	7.0	7.3	7.6	7.9	6.7	7.5	7.8	8.1	8.5	7.0	7.8	8.1	8.5	8.9	7.7	8.7	9.1	9.5	9.9
	5	4.6	5.1	5.3	5.5	5.8	5.7	6.4	6.6	6.9	7.2	6.1	6.8	7.1	7.4	7.8	6.4	7.2	7.5	7.8	8.1	7.1	8.0	8.3	8.7	9.1
	10	4.1	4.6	4.8	5.0	5.2	5.2	5.8	6.0	6.3	6.6	5.6	6.2	6.5	6.8	7.1	5.9	6.6	6.8	7.1	7.4	6.6	7.4	7.7	8.0	8.4
	15	3.7	4.1	4.3	4.4	4.6	4.7	5.3	5.5	5.7	5.9	5.1	5.7	5.9	6.2	6.4	5.4	6.0	6.2	6.5	6.8	6.1	6.8	7.1	7.4	7.7
7000	-30	5.6	6.3	6.5	6.8	7.1	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.3	7.5	8.4	8.8	9.2	9.7	8.3	9.3	9.8	10.2	10.8
	-25	5.6	6.2	6.5	6.8	7.1	6.8	7.6	7.9	8.3	8.7	7.2	8.1	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6	8.3	9.3	9.8	10.2	10.7
	-20	5.5	6.2	6.4	6.7	7.0	6.7	7.5	7.8	8.2	8.5	7.1	8.0	8.4	8.7	9.1	7.4	8.4	8.7	9.1	9.5	8.2	9.3	9.7	10.1	10.6
	-15	5.3	5.9	6.1	6.4	6.6	6.4	7.2	7.5	7.8	8.1	6.9	7.7	8.0	8.3	8.7	7.2	8.0	8.4	8.7	9.1	7.9	8.9	9.3	9.7	10.2
	-10	5.0	5.6	5.8	6.0	6.3	6.1	6.9	7.1	7.4	7.8	6.6	7.4	7.7	8.0	8.3	6.9	7.7	8.0	8.4	8.7	7.6	8.6	8.9	9.3	9.8
	-5	4.6	5.1	5.3	5.5	5.7	5.7	6.3	6.6	6.8	7.1	6.1	6.8	7.1	7.4	7.7	6.4	7.1	7.4	7.7	8.1	7.1	8.0	8.3	8.7	9.1
	0	4.1	4.5	4.7	4.9	5.1	5.1	5.7	6.0	6.2	6.5	5.5	6.2	6.4	6.7	7.0	5.8	6.5	6.8	7.0	7.4	6.5	7.3	7.6	7.9	8.3
	5	3.6	4.0	4.2	4.3	4.5	4.6	5.2	5.4	5.6	5.8	5.0	5.6	5.8	6.1	6.3	5.3	5.9	6.2	6.4	6.7	6.0	6.7	7.0	7.3	7.6
	10	3.2	3.5	3.7	3.8	4.0	4.2	4.7	4.8	5.0	5.2	4.6	5.1	5.3	5.5	5.7	4.8	5.4	5.6	5.8	6.1	5.5	6.1	6.4	6.7	7.0
	15	2.8	3.1	3.2	3.3	3.5	3.8	4.2	4.4	4.5	4.7	4.1	4.6	4.8	5.0	5.2	4.4	4.9	5.1	5.3	5.5	5.0	5.6	5.9	6.1	6.4
8000	-20	2.4	2.7	2.8	2.9	3.0	3.4	3.7	3.9	4.0	4.2	3.7	4.1	4.3	4.5	4.7	4.0	4.4	4.6	4.8	5.0	4.6	5.1	5.3	5.6	5.8
	25	1.9	2.1	2.1	2.2	2.3	2.8	3.1	3.2	3.3	3.4	3.1	3.4	3.6	3.7	3.9	3.3	3.7	3.9	4.0	4.2	3.9	4.4	4.6	4.8	5.0
	30	1.3	1.4	1.4	1.5	1.5	2.1	2.3	2.4	2.5	2.6	2.4	2.7	2.8	2.9	3.0	2.6	2.9	3.0	3.2	3.3	3.2	3.6	3.7	3.9	4.0
	35	.6	.7	.7	.7	.8	1.4	1.6	1.6	1.7	1.8	1.7	1.9	2.0	2.1	2.2	1.9	2.2	2.2	2.3	2.4	2.5	2.8	2.9	3.0	3.1
	40	.0	.0	.0	.0	.0	.7	.8	.9	.9	.9	1.0	1.1	1.2	1.2	1.3	1.2	1.4	1.4	1.5	1.5	1.7	1.9	2.0	2.1	2.2
	45	.0	.0	.0	.0	.0	.7	.8	.9	.9	.9	1.0	1.1	1.2	1.2	1.3	1.2	1.4	1.4	1.5	1.5	1.7	1.9	2.0	2.1	2.2



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																								
		10000					9500					9000					8500					8000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
40	-30	9.0	10.2	10.7	11.3	11.9	10.0	11.4	11.9	12.5	13.2	11.0	12.6	13.3	14.0	14.8	12.2	14.0	14.8	15.6	16.5	13.5	15.6	16.4	17.4	18.5
	-25	9.0	10.2	10.7	11.3	11.9	10.0	11.4	11.9	12.5	13.2	11.0	12.6	13.2	14.0	14.7	12.2	14.0	14.7	15.6	16.5	13.5	15.6	16.4	17.4	18.4
	-20	9.0	10.3	10.7	11.3	11.9	10.0	11.4	11.9	12.5	13.2	11.1	12.6	13.3	14.0	14.7	12.2	14.0	14.8	15.6	16.4	13.5	15.6	16.4	17.4	18.4
	-15	9.1	10.3	10.7	11.3	11.9	10.0	11.4	11.9	12.5	13.2	11.1	12.6	13.3	14.0	14.7	12.3	14.0	14.8	15.6	16.4	13.6	15.6	16.4	17.4	18.4
	-10	9.1	10.3	10.8	11.3	11.9	10.0	11.4	12.0	12.5	13.2	11.1	12.7	13.3	14.0	14.7	12.3	14.1	14.8	15.6	16.4	13.6	15.6	16.5	17.4	18.4
	-5	9.1	10.3	10.8	11.3	11.9	10.1	11.4	12.0	12.6	13.2	11.1	12.7	13.3	14.0	14.7	12.3	14.1	14.8	15.6	16.4	13.7	15.7	16.5	17.4	18.4
	0	9.1	10.2	10.7	11.2	11.8	10.0	11.4	11.9	12.5	13.1	11.1	12.6	13.2	13.9	14.6	12.3	14.0	14.7	15.5	16.3	13.6	15.6	16.4	17.3	18.3
	5	8.7	9.8	10.2	10.7	11.2	9.6	10.9	11.4	11.9	12.5	10.6	12.1	12.7	13.3	14.0	11.8	13.5	14.1	14.8	15.6	13.1	15.0	15.8	16.6	17.5
	10	8.1	9.1	9.5	9.9	10.4	9.0	10.1	10.6	11.1	11.7	10.0	11.3	11.9	12.4	13.1	11.1	12.6	13.3	13.9	14.7	12.3	14.1	14.8	15.6	16.5
	15	7.5	8.5	8.8	9.2	9.7	8.4	9.5	9.9	10.4	10.9	9.4	10.6	11.1	11.6	12.2	10.4	11.9	12.5	13.1	13.8	11.7	13.3	14.0	14.7	15.5
20	7.0	7.8	8.2	8.6	9.0	7.8	8.8	9.2	9.7	10.1	8.8	9.9	10.4	10.9	11.4	9.8	11.2	11.7	12.3	12.9	11.0	12.5	13.2	13.8	14.6	
25	6.4	7.2	7.6	7.9	8.3	7.3	8.2	8.6	9.0	9.4	8.2	9.3	9.7	10.1	10.6	9.2	10.4	10.9	11.5	12.1	10.3	11.8	12.3	13.0	13.7	
30	5.7	6.4	6.7	7.0	7.3	6.5	7.3	7.6	8.0	8.3	7.3	8.3	8.7	9.1	9.5	8.3	9.4	9.9	10.4	10.9	9.4	10.7	11.2	11.8	12.4	
35	4.8	5.4	5.6	5.8	6.1	5.5	6.2	6.5	6.8	7.1	6.3	7.2	7.5	7.8	8.2	7.3	8.2	8.6	9.0	9.5	8.3	9.4	9.8	10.3	10.9	
40	3.9	4.3	4.5	4.7	4.9	4.6	5.1	5.3	5.6	5.8	5.3	6.0	6.3	6.6	6.9	6.2	7.0	7.3	7.7	8.1	7.1	8.1	8.5	8.9	9.4	
45	3.0	3.4	3.5	3.7	3.8	3.7	4.1	4.3	4.5	4.7	4.4	5.0	5.2	5.4	5.7	5.2	5.9	6.2	6.5	6.8	6.1	6.9	7.3	7.6	8.0	
46	2.8	3.1	3.3	3.4	3.5	3.4	3.9	4.0	4.2	4.4	4.1	4.7	4.9	5.1	5.3	4.9	5.6	5.8	6.1	6.4	5.8	6.6	6.9	7.2	7.6	
50	-35	9.1	10.3	10.8	11.3	11.9	10.0	11.4	12.0	12.6	13.3	11.1	12.7	13.3	14.0	14.8	12.3	14.1	14.8	15.6	16.5	13.6	15.6	16.5	17.4	18.5
	-30	9.1	10.3	10.8	11.3	11.9	10.0	11.4	12.0	12.6	13.2	11.1	12.7	13.3	14.0	14.8	12.3	14.1	14.8	15.6	16.5	13.6	15.6	16.5	17.4	18.5
	-25	9.1	10.3	10.8	11.3	11.9	10.0	11.4	12.0	12.6	13.2	11.1	12.7	13.3	14.0	14.7	12.3	14.1	14.8	15.6	16.5	13.6	15.6	16.5	17.4	18.4
	-20	9.1	10.3	10.8	11.3	11.9	10.1	11.4	12.0	12.6	13.2	11.1	12.7	13.3	14.0	14.7	12.3	14.1	14.8	15.6	16.5	13.6	15.7	16.5	17.4	18.4
	-15	9.1	10.3	10.8	11.3	11.9	10.1	11.4	12.0	12.6	13.2	11.1	12.7	13.3	14.0	14.7	12.3	14.1	14.8	15.6	16.4	13.6	15.7	16.5	17.4	18.4
	-10	9.0	10.1	10.6	11.1	11.7	9.9	11.3	11.8	12.4	13.0	11.0	12.5	13.1	13.8	14.5	12.2	13.9	14.6	15.3	16.2	13.5	15.5	16.2	17.1	18.1
	-5	8.8	10.0	10.4	10.9	11.5	9.8	11.1	11.6	12.1	12.8	10.8	12.3	12.9	13.5	14.2	12.0	13.7	14.4	15.1	15.9	13.3	15.2	16.0	16.9	17.8
	0	8.5	9.6	10.1	10.5	11.0	9.5	10.7	11.2	11.7	12.3	10.5	11.9	12.5	13.1	13.8	11.7	13.3	13.9	14.6	15.4	12.9	14.8	15.5	16.4	17.3
	5	8.0	9.0	9.4	9.8	10.3	8.9	10.1	10.5	11.0	11.6	9.9	11.2	11.8	12.3	13.0	11.0	12.5	13.1	13.8	14.5	12.3	14.0	14.7	15.5	16.3
	10	7.4	8.4	8.7	9.1	9.6	8.3	9.4	9.8	10.3	10.8	9.3	10.5	11.0	11.5	12.1	10.4	11.8	12.3	13.0	13.6	11.6	13.2	13.8	14.6	15.4
15	6.9	7.8	8.1	8.5	8.8	7.7	8.7	9.1	9.5	10.0	8.7	9.8	10.3	10.8	11.3	9.7	11.0	11.6	12.1	12.8	10.9	12.4	13.0	13.7	14.4	
20	6.4	7.2	7.5	7.9	8.2	7.3	8.2	8.5	8.9	9.4	8.2	9.2	9.7	10.1	10.6	9.2	10.4	10.9	11.4	12.0	10.3	11.8	12.3	12.9	13.6	
25	6.0	6.7	7.0	7.3	7.6	6.8	7.6	8.0	8.3	8.7	7.7	8.7	9.1	9.5	9.9	8.7	9.8	10.3	10.8	11.3	9.8	11.1	11.6	12.2	12.9	
30	5.1	5.7	6.0	6.2	6.5	5.9	6.6	6.9	7.2	7.5	6.7	7.5	7.9	8.2	8.6	7.6	8.6	9.0	9.5	9.9	8.7	9.8	10.3	10.8	11.4	
35	4.2	4.7	4.9	5.1	5.3	4.9	5.5	5.7	6.0	6.3	5.7	6.4	6.7	7.0	7.3	6.6	7.4	7.8	8.1	8.5	7.5	8.6	9.0	9.4	9.9	
40	3.3	3.7	3.9	4.0	4.2	4.0	4.5	4.7	4.9	5.1	4.7	5.3	5.6	5.8	6.1	5.6	6.3	6.6	6.9	7.2	6.5	7.3	7.7	8.1	8.5	
44	2.6	2.9	3.1	3.2	3.3	3.3	3.7	3.8	4.0	4.2	4.0	4.5	4.7	4.9	5.1	4.7	5.4	5.6	5.9	6.1	5.6	6.4	6.6	7.0	7.3	
60	-35	9.1	10.4	10.8	11.4	12.0	10.1	11.5	12.0	12.6	13.3	11.1	12.7	13.4	14.0	14.8	12.3	14.1	14.8	15.6	16.5	13.6	15.7	16.5	17.5	18.5
	-30	9.1	10.3	10.8	11.3	11.9	10.1	11.5	12.0	12.6	13.3	11.1	12.7	13.3	14.0	14.8	12.3	14.1	14.8	15.6	16.5	13.6	15.7	16.5	17.4	18.4
	-25	9.1	10.3	10.8	11.3	11.9	10.1	11.5	12.0	12.6	13.3	11.2	12.7	13.3	14.0	14.8	12.4	14.1	14.8	15.6	16.5	13.7	15.7	16.5	17.4	18.4
	-20	9.2	10.4	10.8	11.3	11.9	10.1	11.5	12.0	12.6	13.2	11.2	12.7	13.3	14.0	14.8	12.4	14.1	14.8	15.6	16.5	13.7	15.7	16.5	17.4	18.4
	-15	9.1	10.3	10.7	11.2	11.8	10.1	11.4	11.9	12.5	13.1	11.1	12.6	13.2	13.9	14.6	12.3	14.0	14.7	15.5	16.3	13.6	15.6	16.4	17.3	18.3
	-10	8.9	10.1	10.5	11.0	11.5	9.9	11.2	11.7	12.2	12.8	10.9	12.4	13.0	13.6	14.3	12.1	13.8	14.4	15.2	16.0	13.4	15.3	16.1	17.0	17.9
	-5	8.6	9.7	10.1	10.5	11.1	9.5	10.7	11.2	11.8	12.3	10.5	11.9	12.5	13.1	13.8	11.7	13.3	13.9	14.6	15.4	13.0	14.8	15.6	16.4	17.3
	0	8.0	9.0	9.3	9.8	10.2	8.9	10.0	10.4	10.9	11.5	9.9	11.2	11.7	12.2	12.9	11.0	12.5	13.1	13.7	14.4	12.2	13.9	14.6	15.4	16.2
	5	7.4	8.3	8.6	9.0	9.5	8.2	9.3	9.7	10.2	10.7	9.2	10.4	10.9	11.4	12.0	10.3	11.7	12.2	12.8	13.5	11.5	13.1	13.7	14.4	15.2
	10	6.8	7.7	8.0	8.4	8.7	7.7	8.6	9.0	9.4	9.9	8.6	9.7	10.2	10.6	11.2	9.7	10.9	11.5	12.0	12.6	10.8	12.3	12.9	13.6	14.3
15	6.3	7.1	7.4	7.7	8.1	7.1	8.0	8.4	8.8	9.2	8.1	9.1	9.5	9.9	10.4	9.1	10.3	10.7	11.3	11.8	10.2	11.6	12.1	12.7	13.4	
20	5.9	6.6	6.8	7.1	7.5	6.7	7.5	7.8	8.2	8.5	7.5	8.5	8.9	9.3	9.7	8.5	9.6	10.1	10.6	11.1	9.6	10.9	11.4	12.0	12.6	
25	5.3	5.9	6.1	6.4	6.7	6.0	6.8	7.1	7.4	7.7	6.9	7.7	8.1	8.5	8.9	7.8	8.8	9								



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		*12375					11500					11200					11000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-35	5.6	6.2	6.5	6.7	7.0	6.7	7.5	7.9	8.2	8.6	7.2	8.1	8.4	8.8	9.2	7.5	8.4	8.8	9.2	9.6
	-30	5.5	6.2	6.4	6.7	7.0	6.7	7.5	7.8	8.2	8.5	7.1	8.0	8.3	8.7	9.1	7.5	8.4	8.7	9.1	9.5
	-25	5.5	6.1	6.4	6.6	6.9	6.7	7.5	7.8	8.1	8.5	7.1	8.0	8.3	8.7	9.0	7.4	8.3	8.7	9.0	9.5
	-20	5.4	6.0	6.2	6.5	6.8	6.6	7.3	7.6	7.9	8.3	7.0	7.8	8.1	8.5	8.9	7.3	8.2	8.5	8.9	9.3
	-15	5.0	5.5	5.7	6.0	6.2	6.1	6.8	7.1	7.4	7.7	6.5	7.3	7.6	7.9	8.2	6.8	7.6	7.9	8.3	8.6
	-10	4.5	5.0	5.2	5.4	5.6	5.6	6.2	6.5	6.8	7.1	6.0	6.7	7.0	7.3	7.6	6.3	7.0	7.3	7.6	8.0
	-5	4.0	4.5	4.6	4.8	5.0	5.1	5.6	5.9	6.1	6.4	5.5	6.1	6.3	6.6	6.9	5.8	6.4	6.7	7.0	7.3
	0	3.5	3.9	4.1	4.2	4.4	4.6	5.1	5.3	5.5	5.7	5.0	5.5	5.7	6.0	6.2	5.2	5.8	6.1	6.3	6.6
	5	3.1	3.5	3.6	3.7	3.9	4.1	4.6	4.7	4.9	5.1	4.5	5.0	5.2	5.4	5.6	4.7	5.3	5.5	5.7	6.0
	10	2.7	3.0	3.1	3.2	3.4	3.7	4.1	4.2	4.4	4.6	4.0	4.5	4.7	4.8	5.0	4.3	4.8	4.9	5.2	5.4
	15	2.3	2.6	2.7	2.8	2.9	3.3	3.6	3.8	3.9	4.1	3.6	4.0	4.2	4.3	4.5	3.9	4.3	4.5	4.6	4.8
	20	1.9	2.1	2.2	2.3	2.4	2.8	3.1	3.2	3.4	3.5	3.2	3.5	3.6	3.8	3.9	3.4	3.8	3.9	4.1	4.3
	25	1.4	1.5	1.6	1.6	1.7	2.2	2.5	2.6	2.6	2.8	2.5	2.8	2.9	3.0	3.2	2.8	3.1	3.2	3.3	3.5
	30	.8	.9	.9	.9	1.0	1.6	1.8	1.9	1.9	2.0	1.9	2.1	2.2	2.3	2.4	2.1	2.4	2.5	2.6	2.7
	35	.2	.2	.2	.2	.2	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.6	1.5	1.6	1.7	1.7	1.8
	37	-.2	-.2	-.2	-.2	-.2	.6	.6	.6	.7	.7	.8	.9	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.3
9000	-35	5.4	6.0	6.2	6.5	6.8	6.5	7.3	7.6	7.9	8.3	7.0	7.8	8.1	8.5	8.9	7.3	8.1	8.5	8.9	9.3
	-30	5.2	5.8	6.1	6.3	6.6	6.4	7.1	7.4	7.7	8.1	6.8	7.6	7.9	8.3	8.6	7.1	8.0	8.3	8.7	9.1
	-25	5.1	5.7	5.9	6.1	6.4	6.2	7.0	7.2	7.5	7.9	6.7	7.4	7.8	8.1	8.4	7.0	7.8	8.1	8.5	8.8
	-20	4.8	5.3	5.6	5.8	6.0	5.9	6.6	6.9	7.2	7.5	6.4	7.1	7.4	7.7	8.0	6.6	7.4	7.7	8.1	8.4
	-15	4.4	4.9	5.1	5.3	5.5	5.5	6.1	6.4	6.6	6.9	5.9	6.6	6.9	7.1	7.4	6.2	6.9	7.2	7.5	7.8
	-10	4.0	4.4	4.6	4.7	4.9	5.0	5.6	5.8	6.0	6.3	5.4	6.0	6.3	6.5	6.8	5.7	6.4	6.6	6.9	7.2
	-5	3.5	3.9	4.0	4.2	4.3	4.5	5.0	5.2	5.4	5.6	4.9	5.5	5.7	5.9	6.1	5.2	5.8	6.0	6.2	6.5
	0	3.1	3.4	3.5	3.6	3.8	4.0	4.5	4.7	4.8	5.0	4.4	4.9	5.1	5.3	5.5	4.7	5.2	5.4	5.6	5.9
	5	2.6	2.9	3.0	3.1	3.2	3.6	4.0	4.1	4.3	4.5	3.9	4.4	4.5	4.7	4.9	4.2	4.7	4.8	5.0	5.3
	10	2.2	2.5	2.6	2.7	2.8	3.2	3.5	3.6	3.8	3.9	3.5	3.9	4.0	4.2	4.4	3.8	4.2	4.3	4.5	4.7
	15	1.9	2.1	2.1	2.2	2.3	2.8	3.1	3.2	3.3	3.4	3.1	3.4	3.6	3.7	3.9	3.3	3.7	3.8	4.0	4.2
	20	1.4	1.6	1.6	1.7	1.7	2.3	2.5	2.6	2.7	2.8	2.6	2.9	3.0	3.1	3.2	2.8	3.1	3.3	3.4	3.5
	25	.9	1.0	1.0	1.1	1.1	1.7	1.9	2.0	2.0	2.1	2.0	2.3	2.3	2.4	2.5	2.3	2.5	2.6	2.7	2.8
	30	.4	.4	.4	.5	.5	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.8	1.7	1.9	1.9	2.0	2.1
	35	-.2	-.2	-.3	-.3	-.3	.5	.6	.6	.6	.6	.8	.9	.9	.9	1.0	1.0	1.1	1.1	1.2	1.2
	37	-.5	-.5	-.5	-.6	-.6	.2	.3	.3	.3	.3	.5	.6	.6	.6	.6	.7	.8	.8	.8	.9
10000	-35	5.1	5.7	5.9	6.1	6.4	6.2	7.0	7.2	7.5	7.9	6.7	7.5	7.8	8.1	8.4	7.0	7.8	8.1	8.5	8.8
	-30	4.9	5.4	5.6	5.9	6.1	6.0	6.7	7.0	7.3	7.6	6.4	7.2	7.5	7.8	8.1	6.7	7.5	7.8	8.2	8.5
	-25	4.7	5.2	5.4	5.6	5.9	5.8	6.5	6.7	7.0	7.3	6.2	6.9	7.2	7.5	7.8	6.5	7.3	7.6	7.9	8.2
	-20	4.3	4.8	4.9	5.1	5.3	5.4	6.0	6.2	6.5	6.7	5.8	6.4	6.7	7.0	7.3	6.1	6.8	7.0	7.3	7.6
	-15	3.9	4.3	4.4	4.6	4.8	4.9	5.5	5.7	5.9	6.2	5.6	6.2	6.5	6.7	7.0	5.6	6.2	6.5	6.7	7.0
	-10	3.4	3.8	4.0	4.1	4.3	4.5	5.0	5.1	5.3	5.6	4.8	5.4	5.6	5.8	6.1	5.1	5.7	5.9	6.1	6.4
	-5	3.0	3.3	3.4	3.6	3.7	4.0	4.4	4.6	4.7	4.9	4.3	4.8	5.0	5.2	5.4	4.6	5.1	5.3	5.5	5.8
	0	2.6	2.8	2.9	3.0	3.2	3.5	3.9	4.0	4.2	4.4	3.9	4.3	4.5	4.6	4.8	4.1	4.6	4.7	4.9	5.1
	5	2.2	2.4	2.5	2.6	2.6	3.1	3.4	3.5	3.7	3.8	3.4	3.8	3.9	4.1	4.2	3.7	4.1	4.2	4.4	4.6
	10	1.8	2.0	2.0	2.1	2.2	2.7	3.0	3.1	3.2	3.3	3.0	3.3	3.5	3.6	3.7	3.2	3.6	3.7	3.9	4.0
	15	1.4	1.6	1.6	1.7	1.7	2.3	2.5	2.6	2.7	2.8	2.6	2.9	3.0	3.1	3.2	2.8	3.1	3.2	3.4	3.5
	20	1.0	1.0	1.1	1.1	1.2	1.8	2.0	2.0	2.1	2.2	2.1	2.3	2.4	2.5	2.6	2.3	2.6	2.6	2.7	2.9
	25	.5	.5	.6	.6	.6	1.3	1.4	1.5	1.5	1.6	1.6	1.7	1.8	1.9	1.9	1.8	2.0	2.0	2.1	2.2
	30	.0	.0	.0	.0	.0	.7	.8	.8	.9	.9	1.0	1.1	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5
	33	-.5	-.5	-.5	-.6	-.6	.2	.3	.3	.3	.3	.5	.6	.6	.6	.6	.7	.8	.8	.8	.9
	37	-.8	-.8	-.8	-.9	-.9	.1	.2	.2	.2	.2	.3	.4	.4	.4	.4	.5	.6	.6	.6	.6
11000	-35	4.6	5.1	5.3	5.5	5.8	5.7	6.4	6.6	6.9	7.2	6.1	6.8	7.1	7.4	7.7	6.4	7.2	7.5	7.8	8.1
	-30	4.4	4.9	5.1	5.3	5.5	5.5	6.1	6.4	6.6	6.9	5.9	6.6	6.9	7.1	7.5	6.2	6.9	7.2	7.5	7.8
	-25	4.2	4.6	4.8	5.0	5.2	5.2	5.8	6.0	6.3	6.5	5.6	6.3	6.5	6.8	7.1	5.9	6.6	6.8	7.1	7.4
	-20	3.8	4.2	4.3	4.5	4.6	4.8	5.3	5.5	5.7	6.0	5.2	5.8	6.0	6.2	6.5	5.5	6.1	6.3	6.6	6.8
	-15	3.4	3.7	3.8	4.0	4.1	4.4	4.8	5.0	5.2	5.4	4.7	5.3	5.5	5.7	5.9	5.0	5.6	5.8	6.0	6.3
	-10	2.9	3.2	3.4	3.5	3.6	3.9	4.3	4.5	4.7	4.9	4.3	4.8	4.9	5.1	5.3	4.5	5.0	5.2	5.4	5.7
	-5	2.5	2.8	2.9	3.0	3.1	3.4	3.8	4.0	4.1	4.3	3.8	4.2	4.4	4.5	4.7	4.0	4.5	4.7	4.8	5.0
	0	2.1	2.3	2.4	2.5	2.6	3.0	3.3	3.4	3.6	3.7	3.3	3.7	3.8	4.0	4.1	3.6	4.0	4.1	4.3	4.5
	5	1.7	1.9	1.9	2.0	2.1	2.6	2.9	3.0	3.1	3.2	2.9	3.2	3.3	3.5	3.6	3.2	3.5	3.6	3.8	3.9
	10	1.3	1.5	1.5	1.6	1.6	2.2	2.4	2.5	2.6	2.7	2.5	2.8	2.9	3.0	3.1	2.7	3.0	3.1	3.3	3.4
	15	.9	1.0	1.1	1.1	1.2	1.8	2.0	2.0	2.1	2.2	2.1	2.3	2.4	2.5	2.6	2.3	2.5	2.6	2.7	2.8
	20	.5	.6	.6	.6	.6	1.3	1.5	1.5	1.6	1.6	1.6	1.8	1.8	1.9	2.0	1.8	2.0	2.1	2.2	2.3
	25	.1	.1	.1	.1	.1	.9	.9	1.0	1.0	1.1	1.1	1.3	1.3	1.4	1.4	1.3	1.5	1.5	1.6	1.7
	30	-.5	-.5	-.5	-.5	-.6	.3	.3	.3	.3	.3	.5	.6	.6	.6	.7	.7	.8	.8	.9	.9
	31	-.6	-.7	-.7	-.8	-.8	.1	.1	.1	.1	.1	.3	.4	.4	.4	.4	.5	.6	.6	.6	.6

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM  
DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-48 (Sheet 5)



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8	-35	9.2	10.4	10.8	11.3	11.9	10.1	11.5	12.0	12.6	13.2	11.2	12.7	13.3	14.0	14.7	12.4	14.1	14.8	15.6	16.5
0	-30	9.1	10.3	10.8	11.3	11.8	10.1	11.4	12.0	12.5	13.2	11.2	12.7	13.3	13.9	14.7	12.4	14.1	14.8	15.5	16.4
0	-25	9.1	10.3	10.7	11.2	11.7	10.1	11.4	11.9	12.4	13.1	11.1	12.6	13.2	13.8	14.6	12.3	14.0	14.7	15.4	16.2
0	-20	9.0	10.1	10.5	11.0	11.5	9.9	11.2	11.7	12.3	12.9	11.0	12.4	13.0	13.6	14.3	12.2	13.8	14.5	15.2	16.0
0	-15	8.4	9.5	9.9	10.3	10.8	9.4	10.6	11.0	11.5	12.1	10.4	11.7	12.3	12.9	13.5	11.5	13.1	13.7	14.4	15.1
0	-10	7.9	8.8	9.2	9.6	10.1	8.8	9.9	10.3	10.8	11.3	9.8	11.0	11.5	12.1	12.7	10.9	12.3	12.9	13.5	14.2
5	-5	7.3	8.2	8.5	8.9	9.3	8.1	9.2	9.5	10.0	10.5	9.1	10.3	10.7	11.2	11.8	10.2	11.5	12.0	12.6	13.3
0	0	6.7	7.5	7.8	8.2	8.5	7.5	8.5	8.8	9.2	9.7	8.5	9.5	10.0	10.4	10.9	9.5	10.7	11.2	11.8	12.4
5	5	6.2	6.9	7.2	7.5	7.8	7.0	7.8	8.2	8.5	8.9	7.9	8.9	9.3	9.7	10.1	8.9	10.0	10.5	11.0	11.5
10	10	5.7	6.3	6.6	6.9	7.2	6.4	7.2	7.5	7.9	8.2	7.3	8.2	8.6	9.0	9.4	8.3	9.3	9.8	10.2	10.7
15	15	5.2	5.8	6.0	6.3	6.6	6.0	6.7	7.0	7.3	7.6	6.8	7.6	8.0	8.3	8.7	7.7	8.7	9.1	9.5	10.0
20	20	4.7	5.2	5.4	5.7	5.9	5.4	6.1	6.3	6.6	6.9	6.2	7.0	7.3	7.6	8.0	7.1	8.0	8.4	8.8	9.2
25	25	4.0	4.5	4.6	4.8	5.0	4.7	5.3	5.5	5.7	6.0	5.5	6.1	6.4	6.7	7.0	6.3	7.1	7.4	7.8	8.1
30	30	3.3	3.7	3.8	4.0	4.2	4.0	4.4	4.6	4.8	5.0	4.7	5.3	5.5	5.7	6.0	5.5	6.2	6.5	6.8	7.1
35	35	2.6	2.9	3.0	3.1	3.2	3.2	3.6	3.7	3.9	4.0	3.9	4.4	4.5	4.7	5.0	4.7	5.3	5.5	5.7	6.0
37	37	2.1	2.3	2.4	2.5	2.6	2.7	3.0	3.2	3.3	3.4	3.4	3.8	3.9	4.1	4.3	4.1	4.6	4.8	5.1	5.3
9	-35	9.0	10.1	10.5	11.0	11.6	9.9	11.2	11.7	12.3	12.9	11.0	12.4	13.0	13.7	14.4	12.2	13.8	14.5	15.2	16.0
0	-30	8.8	9.9	10.3	10.8	11.3	9.7	11.0	11.5	12.0	12.6	10.8	12.2	12.8	13.4	14.1	12.0	13.6	14.2	15.0	15.7
0	-25	8.6	9.7	10.1	10.6	11.1	9.6	10.8	11.3	11.8	12.4	10.6	12.0	12.5	13.1	13.8	11.8	13.4	14.0	14.7	15.4
0	-20	8.3	9.3	9.7	10.1	10.6	9.2	10.4	10.8	11.3	11.8	10.2	11.5	12.1	12.6	13.3	11.3	12.9	13.5	14.1	14.8
0	-15	7.8	8.7	9.1	9.5	9.9	8.7	9.8	10.2	10.6	11.1	9.7	10.9	11.4	11.9	12.5	10.8	12.2	12.7	13.4	14.0
0	-10	7.2	8.1	8.4	8.8	9.2	8.1	9.1	9.5	9.9	10.4	9.1	10.2	10.7	11.1	11.7	10.1	11.4	12.0	12.5	13.2
5	-5	6.7	7.5	7.8	8.1	8.5	7.5	8.4	8.8	9.2	9.6	8.4	9.5	9.9	10.3	10.8	9.4	10.7	11.2	11.7	12.3
0	0	6.1	6.8	7.1	7.4	7.7	6.9	7.8	8.1	8.4	8.8	7.8	8.8	9.2	9.6	10.0	8.8	9.9	10.4	10.9	11.4
5	5	5.6	6.2	6.5	6.8	7.1	6.4	7.1	7.4	7.8	8.1	7.2	8.1	8.5	8.9	9.3	8.2	9.2	9.7	10.1	10.6
10	10	5.1	5.7	5.9	6.2	6.4	5.9	6.6	6.8	7.1	7.4	6.7	7.5	7.8	8.2	8.6	7.6	8.6	9.0	9.4	9.8
15	15	4.6	5.2	5.4	5.6	5.8	5.4	6.0	6.3	6.5	6.8	6.2	6.9	7.2	7.5	7.9	7.1	8.0	8.3	8.7	9.1
20	20	4.1	4.5	4.7	4.9	5.1	4.8	5.3	5.6	5.8	6.1	5.6	6.2	6.5	6.8	7.1	6.4	7.2	7.5	7.9	8.2
25	25	3.5	3.8	4.0	4.2	4.3	4.1	4.6	4.8	5.0	5.2	4.9	5.5	5.7	5.9	6.2	5.7	6.4	6.7	7.0	7.3
30	30	2.8	3.1	3.3	3.4	3.5	3.5	3.9	4.0	4.2	4.4	4.2	4.7	4.9	5.1	5.3	5.0	5.6	5.8	6.1	6.3
35	35	2.1	2.3	2.4	2.5	2.6	2.7	3.0	3.1	3.2	3.3	3.3	3.7	3.9	4.0	4.2	4.1	4.6	4.8	5.0	5.2
1	-35	8.6	9.7	10.1	10.6	11.1	9.6	10.8	11.3	11.8	12.4	10.6	12.0	12.6	13.2	13.8	11.8	13.4	14.0	14.7	15.5
0	-30	8.4	9.4	9.8	10.3	10.8	9.3	10.5	11.0	11.5	12.0	10.4	11.7	12.2	12.8	13.5	11.5	13.0	13.7	14.3	15.1
0	-25	8.1	9.1	9.5	9.9	10.4	9.1	10.2	10.6	11.1	11.7	10.1	11.4	11.9	12.4	13.1	11.2	12.7	13.3	13.9	14.6
0	-20	7.6	8.6	8.9	9.3	9.7	8.5	9.6	10.0	10.5	11.0	9.5	10.7	11.2	11.7	12.3	10.6	12.0	12.6	13.2	13.8
0	-15	7.1	8.0	8.3	8.7	9.1	8.0	9.0	9.4	9.8	10.2	9.0	10.1	10.5	11.0	11.5	10.0	11.3	11.8	12.4	13.0
0	-10	6.6	7.4	7.7	8.0	8.4	7.5	8.4	8.7	9.1	9.5	8.4	9.4	9.8	10.3	10.7	9.4	10.6	11.1	11.6	12.2
5	-5	6.0	6.8	7.0	7.3	7.6	6.9	7.7	8.0	8.3	8.7	7.7	8.7	9.1	9.5	9.9	8.7	9.8	10.3	10.8	11.3
0	0	5.5	6.2	6.4	6.7	7.0	6.3	7.1	7.3	7.7	8.0	7.2	8.0	8.4	8.8	9.2	8.1	9.1	9.5	10.0	10.5
5	5	5.0	5.6	5.8	6.1	6.3	5.8	6.5	6.7	7.0	7.3	6.6	7.4	7.7	8.1	8.4	7.5	8.5	8.8	9.2	9.7
10	10	4.6	5.1	5.3	5.5	5.7	5.3	5.9	6.1	6.4	6.7	6.1	6.8	7.1	7.4	7.8	7.0	7.9	8.2	8.6	9.0
15	15	4.1	4.6	4.7	4.9	5.1	4.8	5.4	5.6	5.8	6.1	5.6	6.3	6.5	6.8	7.1	6.5	7.3	7.6	7.9	8.3
20	20	3.5	3.9	4.1	4.2	4.4	4.2	4.7	4.9	5.1	5.3	5.0	5.5	5.8	6.0	6.3	5.8	6.5	6.8	7.1	7.4
25	25	3.0	3.3	3.4	3.5	3.7	3.6	4.0	4.2	4.4	4.5	4.3	4.8	5.0	5.2	5.5	5.1	5.7	6.0	6.2	6.5
30	30	2.3	2.6	2.7	2.8	2.9	2.9	3.3	3.4	3.5	3.7	3.6	4.0	4.2	4.4	4.6	4.4	4.9	5.1	5.3	5.6
33	33	1.7	1.9	2.0	2.1	2.2	2.3	2.6	2.7	2.8	2.9	3.0	3.3	3.5	3.6	3.8	3.7	4.2	4.3	4.5	4.7
1	-35	8.1	9.0	9.4	9.8	10.3	9.0	10.1	10.6	11.0	11.6	10.0	11.3	11.8	12.3	13.0	11.1	12.6	13.2	13.8	14.5
1	-30	7.8	8.8	9.1	9.5	10.0	8.7	9.8	10.2	10.7	11.2	9.7	11.0	11.5	12.0	12.6	10.9	12.3	12.8	13.4	14.1
0	-25	7.5	8.4	8.7	9.1	9.5	8.4	9.4	9.8	10.3	10.7	9.4	10.6	11.0	11.5	12.1	10.5	11.8	12.4	12.9	13.6
0	-20	7.0	7.8	8.1	8.5	8.9	7.9	8.8	9.2	9.6	10.0	8.8	9.9	10.3	10.8	11.3	9.9	11.1	11.6	12.2	12.8
0	-15	6.5	7.2	7.5	7.9	8.2	7.4	8.2	8.6	8.9	9.4	8.3	9.3	9.7	10.1	10.6	9.3	10.5	10.9	11.4	12.0
0	-10	6.0	6.7	6.9	7.2	7.6	6.8	7.6	7.9	8.3	8.7	7.7	8.7	9.0	9.4	9.9	8.7	9.8	10.2	10.7	11.2
5	-5	5.4	6.1	6.3	6.6	6.9	6.2	7.0	7.3	7.6	7.9	7.1	8.0	8.3	8.7	9.1	8.1	9.1	9.5	9.9	10.4
0	0	4.9	5.5	5.7	5.9	6.2	5.7	6.4	6.6	6.9	7.2	6.5	7.3	7.6	8.0	8.3	7.5	8.4	8.7	9.1	9.6
5	5	4.5	5.0	5.2	5.4	5.6	5.2	5.8	6.0	6.3	6.6	6.0	6.7	7.0	7.3	7.6	6.9	7.8	8.1	8.4	8.8
10	10	4.0	4.4	4.6	4.8	5.0	4.7	5.3	5.5	5.7	6.0	5.5	6.2	6.4	6.7	7.0	6.4	7.1	7.4	7.8	8.1
15	15	3.5	3.9	4.1	4.2	4.4	4.2	4.7	4.9	5.1	5.3	5.0	5.6	5.8	6.0	6.3	5.8	6.5	6.8	7.1	7.4
20	20	3.0	3.3	3.5	3.6	3.7	3.7	4.1	4.2	4.4	4.6	4.4	4.9	5.1	5.3	5.5	5.2	5.8	6.1	6.3	6.6
25	25	2.5	2.7	2.8	3.0	3.1	3.1	3.5	3.6	3.7	3.9	3.8	4.3	4.4	4.6	4.8	4.6	5.1	5.3	5.6	5.8
30	30	1.8	2.0	2.0	2.1	2.2	2.4	2.7	2.8	2.9	3.0	3.1	3.4	3.5	3.7	3.8	3.8	4.2	4.4	4.6	4.8
31	31	1.5	1.7	1.8	1.8	1.9	2.1	2.4	2.5	2.6	2.7	2.8	3.1	3.2	3.4	3.5	3.5	3.9	4.1	4.2	4.4



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15<sup>0</sup>CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		*12375					11500					11200					11000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	4.1	4.6	4.8	4.9	5.1	5.2	5.8	6.0	6.2	6.5	5.6	6.2	6.5	6.7	7.0	5.9	6.6	6.8	7.1	7.4
2	-30	4.0	4.4	4.6	4.7	4.9	5.0	5.6	5.8	6.0	6.3	5.4	6.0	6.3	6.5	6.8	5.7	6.3	6.6	6.9	7.1
0	-25	3.6	4.0	4.2	4.3	4.5	4.7	5.2	5.4	5.6	5.8	5.0	5.6	5.8	6.0	6.3	5.3	5.9	6.1	6.4	6.6
0	-20	3.2	3.6	3.7	3.8	4.0	4.2	4.7	4.9	5.0	5.2	4.9	5.4	5.6	5.8	6.1	4.9	5.4	5.6	5.8	6.1
0	-15	2.8	3.1	3.3	3.4	3.5	3.8	4.2	4.4	4.5	4.7	4.2	4.6	4.8	5.0	5.2	4.4	4.9	5.1	5.3	5.5
0	-10	2.4	2.7	2.8	2.9	3.0	3.4	3.7	3.9	4.0	4.2	3.7	4.1	4.3	4.5	4.6	4.0	4.4	4.6	4.8	5.0
0	-5	2.0	2.2	2.3	2.4	2.5	2.9	3.2	3.4	3.5	3.6	3.3	3.6	3.8	3.9	4.1	3.5	3.9	4.0	4.2	4.4
0	0	1.6	1.8	1.8	1.9	2.0	2.5	2.8	2.9	3.0	3.1	2.8	3.1	3.2	3.4	3.5	3.1	3.4	3.5	3.7	3.8
0	5	1.3	1.4	1.4	1.5	1.5	2.1	2.3	2.4	2.5	2.6	2.4	2.7	2.8	2.9	3.0	2.7	2.9	3.0	3.2	3.3
0	10	.9	1.0	1.0	1.1	1.1	1.7	1.9	2.0	2.0	2.1	2.0	2.2	2.3	2.4	2.5	2.2	2.5	2.6	2.7	2.8
0	15	.5	.6	.6	.6	.6	1.3	1.4	1.5	1.5	1.6	1.6	1.8	1.8	1.9	2.0	1.8	2.0	2.1	2.2	2.2
0	20	.1	.1	.1	.2	.2	.9	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.4	1.5	1.6	1.6	1.7
0	25	-.3	-.3	-.3	-.3	-.3	.5	.5	.5	.5	.6	.7	.8	.8	.9	.9	.9	1.0	1.1	1.1	1.1
0	29	-.8	-.9	-.9	-.9	-1.0	-.1	-.1	-.1	-.1	-.1	.1	.2	.2	.2	.2	.3	.4	.4	.4	.4
1	-35	3.7	4.1	4.2	4.4	4.6	4.7	5.2	5.4	5.6	5.9	5.1	5.7	5.9	6.1	6.4	5.4	6.0	6.2	6.5	6.7
3	-30	3.5	3.9	4.0	4.2	4.3	4.5	5.0	5.2	5.4	5.6	4.9	5.4	5.6	5.9	6.1	5.2	5.7	6.0	6.2	6.5
0	-25	3.1	3.4	3.6	3.7	3.8	4.1	4.5	4.7	4.9	5.1	4.5	5.0	5.1	5.3	5.6	4.7	5.2	5.4	5.7	5.9
0	-20	2.7	3.0	3.1	3.2	3.3	3.7	4.1	4.2	4.4	4.5	4.0	4.5	4.6	4.8	5.0	4.3	4.8	4.9	5.1	5.3
0	-15	2.4	2.6	2.7	2.8	2.9	3.3	3.6	3.8	3.9	4.1	3.6	4.0	4.2	4.3	4.5	3.9	4.3	4.5	4.6	4.8
0	-10	2.0	2.2	2.2	2.3	2.4	2.9	3.2	3.3	3.4	3.5	3.2	3.6	3.7	3.8	4.0	3.5	3.8	4.0	4.1	4.3
0	-5	1.6	1.7	1.8	1.8	1.9	2.4	2.7	2.8	2.9	3.0	2.8	3.0	3.2	3.3	3.4	3.0	3.3	3.4	3.6	3.7
0	0	1.2	1.3	1.3	1.4	1.4	2.0	2.2	2.3	2.4	2.5	2.3	2.6	2.7	2.8	2.9	2.6	2.8	2.9	3.0	3.2
0	5	.8	.9	.9	1.0	1.0	1.6	1.8	1.9	1.9	2.0	1.9	2.1	2.2	2.3	2.4	2.2	2.4	2.5	2.6	2.7
0	10	.5	.5	.5	.5	.6	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	1.8	1.9	1.8	1.9	2.0	2.1	2.2
0	15	.1	.1	.1	.1	.1	.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.6	1.6	1.7
0	20	-.2	-.3	-.3	-.3	-.3	.5	.5	.6	.6	.6	.8	.9	.9	.9	1.0	1.0	1.1	1.1	1.1	1.2
0	25	-.7	-.8	-.8	-.8	-.9	.0	.0	.0	.0	.0	.3	.3	.3	.3	.3	.4	.5	.5	.5	.5
0	27	-1.0	-1.1	-1.1	-1.1	-1.2	-.3	-.3	-.3	-.3	-.4	.0	.0	.0	.0	.0	.1	.2	.2	.2	.2
4	-35	3.2	3.6	3.7	3.9	4.0	4.2	4.7	4.9	5.1	5.3	4.6	5.1	5.3	5.5	5.7	4.9	5.4	5.6	5.8	6.1
0	-30	3.0	3.3	3.4	3.5	3.7	4.0	4.4	4.5	4.7	4.9	4.3	4.8	5.0	5.2	5.4	4.6	5.1	5.3	5.5	5.7
0	-25	2.6	2.9	3.0	3.1	3.2	3.5	3.9	4.1	4.2	4.4	3.9	4.3	4.5	4.6	4.8	4.2	4.6	4.8	5.0	5.2
0	-20	2.2	2.5	2.5	2.6	2.7	3.1	3.5	3.6	3.7	3.9	3.5	3.9	4.0	4.2	4.3	3.7	4.1	4.3	4.5	4.6
0	-15	1.9	2.1	2.1	2.2	2.3	2.8	3.1	3.2	3.3	3.4	3.1	3.4	3.6	3.7	3.8	3.3	3.7	3.8	4.0	4.1
0	-10	1.5	1.7	1.7	1.8	1.8	2.4	2.6	2.7	2.8	2.9	2.7	3.0	3.1	3.2	3.3	2.9	3.2	3.3	3.5	3.6
0	-5	1.1	1.2	1.3	1.3	1.3	1.9	2.1	2.2	2.3	2.4	2.3	2.5	2.6	2.7	2.8	2.5	2.7	2.8	2.9	3.1
0	0	.7	.8	.8	.9	.9	1.6	1.7	1.8	1.8	1.9	1.9	2.1	2.1	2.2	2.3	2.1	2.3	2.4	2.5	2.5
0	5	.4	.4	.5	.5	.5	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.7	1.7	1.8	1.7	1.9	1.9	2.0	2.1
0	10	.1	.1	.1	.1	.1	.8	.9	.9	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.3	1.4	1.5	1.6	1.6
0	15	-.3	-.3	-.3	-.3	-.3	.5	.5	.6	.6	.6	.8	.8	.9	.9	.9	1.0	1.1	1.1	1.1	1.2
0	20	-.6	-.6	-.6	-.7	-.7	.1	.2	.2	.2	.2	.4	.5	.5	.5	.5	.6	.7	.7	.7	.7
0	25	-1.1	-1.2	-1.3	-1.3	-1.4	-.5	-.5	-.5	-.5	-.6	-.2	-.2	-.2	-.2	-.3	.0	.0	.0	.0	.0

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM  
DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-48 (Sheet 7)



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	7.5	8.3	8.7	9.1	9.5	8.4	9.4	9.8	10.2	10.7	9.4	10.5	11.0	11.5	12.1	10.4	11.8	12.3	12.9	13.6
2	-30	7.2	8.1	8.4	8.8	9.2	8.1	9.1	9.5	9.9	10.4	9.1	10.3	10.7	11.2	11.7	10.2	11.5	12.0	12.6	13.2
0	-25	6.8	7.6	7.9	8.3	8.6	7.7	8.6	9.0	9.4	9.8	8.7	9.7	10.2	10.6	11.1	9.7	10.9	11.4	12.0	12.5
0	-20	6.3	7.1	7.3	7.7	8.0	7.2	8.0	8.4	8.7	9.1	8.1	9.1	9.5	9.9	10.4	9.1	10.3	10.7	11.2	11.8
0	-15	5.9	6.5	6.8	7.1	7.4	6.7	7.5	7.8	8.1	8.5	7.6	8.5	8.9	9.3	9.7	8.6	9.6	10.1	10.5	11.0
0	-10	5.4	6.0	6.2	6.5	6.7	6.2	6.9	7.2	7.5	7.8	7.1	7.9	8.2	8.6	9.0	8.0	9.0	9.4	9.8	10.2
	-5	4.9	5.4	5.6	5.8	6.1	5.6	6.3	6.5	6.8	7.1	6.5	7.3	7.6	7.9	8.2	7.4	8.3	8.7	9.0	9.5
	0	4.4	4.8	5.0	5.2	5.5	5.1	5.7	5.9	6.2	6.4	5.9	6.6	6.9	7.2	7.5	6.8	7.7	8.0	8.3	8.7
	5	3.9	4.3	4.5	4.7	4.9	4.6	5.2	5.4	5.6	5.8	5.4	6.1	6.3	6.6	6.9	6.3	7.0	7.3	7.7	8.0
	10	3.5	3.8	4.0	4.1	4.3	4.2	4.6	4.8	5.0	5.2	4.9	5.5	5.7	6.0	6.2	5.8	6.4	6.7	7.0	7.3
	15	3.0	3.3	3.4	3.6	3.7	3.7	4.1	4.2	4.4	4.6	4.4	4.9	5.1	5.3	5.5	5.2	5.8	6.1	6.3	6.6
	20	2.5	2.8	2.9	3.0	3.1	3.2	3.5	3.6	3.8	3.9	3.9	4.3	4.5	4.7	4.9	4.7	5.2	5.4	5.6	5.9
	25	2.0	2.2	2.3	2.4	2.5	2.6	2.9	3.0	3.2	3.3	3.3	3.7	3.8	4.0	4.2	4.1	4.5	4.7	4.9	5.1
	29	1.3	1.5	1.5	1.6	1.7	1.9	2.1	2.2	2.3	2.4	2.6	2.9	3.0	3.1	3.2	3.3	3.7	3.8	4.0	4.1
1	-35	6.9	7.7	8.0	8.3	8.7	7.8	8.7	9.1	9.5	9.9	8.7	9.8	10.2	10.7	11.2	9.8	11.1	11.6	12.1	12.7
3	-30	6.7	7.4	7.7	8.1	8.4	7.5	8.4	8.8	9.2	9.6	8.5	9.5	9.9	10.4	10.9	9.6	10.8	11.2	11.7	12.3
0	-25	6.2	6.9	7.2	7.5	7.8	7.0	7.9	8.2	8.5	8.9	8.0	8.9	9.3	9.7	10.1	9.0	10.1	10.5	11.0	11.5
0	-20	5.7	6.4	6.6	6.9	7.2	6.5	7.3	7.6	7.9	8.2	7.4	8.3	8.7	9.0	9.4	8.4	9.5	9.9	10.3	10.8
0	-15	5.3	5.8	6.1	6.3	6.6	6.0	6.7	7.0	7.3	7.6	6.9	7.7	8.1	8.4	8.8	7.9	8.9	9.2	9.6	10.1
0	-10	4.8	5.3	5.5	5.7	6.0	5.6	6.2	6.4	6.7	7.0	6.4	7.2	7.5	7.8	8.1	7.4	8.2	8.6	9.0	9.4
	-5	4.3	4.8	4.9	5.1	5.3	5.0	5.6	5.8	6.0	6.3	5.8	6.5	6.8	7.1	7.4	6.8	7.6	7.9	8.2	8.6
	0	3.8	4.2	4.4	4.6	4.7	4.5	5.0	5.2	5.4	5.7	5.3	5.9	6.2	6.4	6.7	6.2	6.9	7.2	7.5	7.9
	5	3.4	3.7	3.9	4.0	4.2	4.1	4.5	4.7	4.9	5.1	4.8	5.4	5.6	5.8	6.1	5.7	6.4	6.6	6.9	7.2
	10	2.9	3.2	3.4	3.5	3.6	3.6	4.0	4.2	4.3	4.5	4.4	4.8	5.0	5.2	5.5	5.2	5.8	6.0	6.3	6.5
	15	2.5	2.8	2.9	3.0	3.1	3.1	3.5	3.6	3.8	3.9	3.9	4.3	4.5	4.6	4.8	4.7	5.2	5.4	5.6	5.9
	20	2.1	2.3	2.4	2.4	2.5	2.7	3.0	3.1	3.2	3.3	3.4	3.8	3.9	4.1	4.2	4.1	4.6	4.8	5.0	5.2
	25	1.5	1.6	1.7	1.8	1.8	2.1	2.3	2.4	2.5	2.6	2.7	3.0	3.1	3.3	3.4	3.5	3.8	4.0	4.2	4.3
	27	1.1	1.3	1.3	1.4	1.4	1.7	1.9	2.0	2.0	2.1	2.4	2.6	2.7	2.8	2.9	3.1	3.4	3.5	3.7	3.8
1	-35	6.3	7.1	7.4	7.7	8.0	7.2	8.0	8.4	8.7	9.1	8.1	9.1	9.5	9.9	10.4	9.2	10.3	10.8	11.3	11.8
4	-30	6.0	6.7	7.0	7.3	7.6	6.9	7.7	8.0	8.3	8.7	7.8	8.7	9.1	9.5	9.9	8.8	9.9	10.3	10.8	11.3
0	-25	5.6	6.2	6.4	6.7	7.0	6.4	7.1	7.4	7.7	8.0	7.3	8.1	8.5	8.8	9.2	8.3	9.3	9.7	10.1	10.6
0	-20	5.1	5.7	5.9	6.1	6.4	5.9	6.6	6.8	7.1	7.4	6.8	7.5	7.9	8.2	8.5	7.7	8.7	9.0	9.4	9.8
0	-15	4.7	5.2	5.4	5.6	5.8	5.4	6.0	6.3	6.5	6.8	6.3	7.0	7.3	7.6	7.9	7.2	8.1	8.4	8.8	9.2
0	-10	4.2	4.7	4.8	5.0	5.2	4.9	5.5	5.7	5.9	6.2	5.8	6.4	6.7	7.0	7.3	6.7	7.5	7.8	8.1	8.5
	-5	3.7	4.1	4.3	4.4	4.6	4.4	4.9	5.1	5.3	5.5	5.2	5.8	6.1	6.3	6.6	6.1	6.8	7.1	7.4	7.7
	0	3.3	3.6	3.8	3.9	4.1	4.0	4.4	4.6	4.7	4.9	4.7	5.3	5.5	5.7	5.9	5.6	6.2	6.5	6.8	7.1
	5	2.8	3.1	3.3	3.4	3.5	3.5	3.9	4.0	4.2	4.4	4.3	4.7	4.9	5.1	5.3	5.1	5.7	5.9	6.1	6.4
	10	2.4	2.7	2.8	2.9	3.0	3.1	3.4	3.5	3.7	3.8	3.8	4.2	4.4	4.6	4.7	4.6	5.1	5.3	5.5	5.8
	15	2.0	2.3	2.3	2.4	2.5	2.7	3.0	3.1	3.2	3.3	3.4	3.7	3.9	4.0	4.2	4.1	4.6	4.8	5.0	5.2
	20	1.6	1.8	1.9	2.0	2.0	2.3	2.5	2.6	2.7	2.8	2.9	3.2	3.4	3.5	3.6	3.7	4.1	4.2	4.4	4.6
	25	1.0	1.1	1.1	1.1	1.2	1.5	1.7	1.7	1.8	1.9	2.2	2.4	2.5	2.6	2.7	2.9	3.2	3.3	3.4	3.6

12207-04-00

Figure 4-48 (Sheet 8)



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																																			
		*12375					11500					11200					11000					10500															
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS															
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30						
0	-35	4.4	5.0	5.2	5.5	5.7	5.5	6.2	6.5	6.9	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.0	7.4	7.8	8.2	6.9	7.9	8.3	8.8	9.3											
	-30	4.4	5.0	5.2	5.4	5.7	5.5	6.2	6.5	6.8	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.0	7.4	7.8	8.2	6.9	7.9	8.3	8.8	9.3											
	-25	4.4	5.0	5.2	5.4	5.7	5.5	6.2	6.5	6.8	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.0	7.4	7.8	8.2	6.9	7.9	8.3	8.8	9.3											
	-20	4.4	5.0	5.2	5.4	5.7	5.5	6.2	6.5	6.8	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.0	7.4	7.8	8.2	6.9	7.9	8.3	8.8	9.2											
	-15	4.4	5.0	5.2	5.4	5.7	5.5	6.2	6.5	6.8	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.0	7.4	7.8	8.2	7.0	7.9	8.3	8.8	9.2											
	-10	4.4	5.0	5.2	5.4	5.7	5.5	6.2	6.5	6.8	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.1	7.4	7.8	8.2	7.0	8.0	8.3	8.8	9.2											
	-5	4.4	5.0	5.2	5.4	5.7	5.5	6.3	6.5	6.9	7.2	5.9	6.7	7.0	7.4	7.8	6.2	7.1	7.4	7.8	8.2	7.0	8.0	8.4	8.8	9.2											
	0	4.3	4.9	5.1	5.3	5.6	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.9	7.8	8.2	8.6	9.0											
	5	4.2	4.7	4.9	5.1	5.4	5.3	6.0	6.2	6.5	6.8	5.7	6.4	6.7	7.0	7.4	6.0	6.8	7.1	7.4	7.8	6.7	7.6	8.0	8.4	8.8											
	10	3.2	3.7	3.8	4.0	4.2	4.3	4.8	5.0	5.3	5.5	4.7	5.3	5.5	5.8	6.0	4.9	5.6	5.8	6.1	6.4	5.6	6.4	6.7	7.0	7.4											
10	-35	4.3	4.8	5.1	5.3	5.6	5.4	6.1	6.4	6.7	7.1	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.8	7.8	8.2	8.6	9.1											
	-30	4.3	4.8	5.0	5.3	5.6	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.8	7.8	8.2	8.6	9.1											
	-25	4.3	4.8	5.0	5.3	5.6	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.8	7.8	8.2	8.6	9.1											
	-20	4.3	4.8	5.1	5.3	5.5	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.8	7.8	8.2	8.6	9.0											
	-15	4.3	4.8	5.1	5.3	5.5	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.9	7.8	8.2	8.6	9.0											
	-10	4.3	4.9	5.1	5.3	5.6	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.9	7.8	8.2	8.6	9.0											
	-5	4.3	4.8	5.0	5.2	5.5	5.4	6.1	6.3	6.6	7.0	5.8	6.5	6.8	7.2	7.5	6.1	6.9	7.2	7.5	7.9	6.8	7.7	8.1	8.5	9.0											
	0	4.2	4.7	4.9	5.1	5.3	5.2	5.9	6.2	6.5	6.8	5.6	6.4	6.7	7.0	7.3	5.9	6.7	7.0	7.3	7.7	6.7	7.6	7.9	8.3	8.7											
	5	3.7	4.2	4.3	4.5	4.7	4.7	5.4	5.6	5.8	6.1	5.1	5.8	6.1	6.4	6.7	5.4	6.1	6.4	6.7	7.0	6.2	7.0	7.3	7.6	8.0											
	10	2.8	3.1	3.3	3.4	3.6	3.8	4.2	4.4	4.6	4.9	4.1	4.7	4.9	5.1	5.3	4.4	5.0	5.2	5.4	5.7	5.1	5.8	6.0	6.3	6.6											
20	-35	4.2	4.8	5.0	5.2	5.5	5.3	6.0	6.3	6.6	6.9	5.7	6.5	6.8	7.1	7.5	6.0	6.8	7.1	7.5	7.9	6.8	7.7	8.1	8.5	9.0											
	-30	4.2	4.8	5.0	5.2	5.5	5.3	6.0	6.3	6.6	6.9	5.7	6.5	6.8	7.1	7.5	6.0	6.8	7.1	7.5	7.9	6.8	7.7	8.1	8.5	8.9											
	-25	4.2	4.8	5.0	5.2	5.5	5.3	6.0	6.3	6.6	6.9	5.7	6.5	6.8	7.1	7.5	6.0	6.8	7.1	7.5	7.9	6.8	7.7	8.1	8.5	8.9											
	-20	4.2	4.8	5.0	5.2	5.5	5.3	6.0	6.3	6.6	6.9	5.7	6.5	6.8	7.1	7.5	6.0	6.8	7.1	7.5	7.9	6.8	7.7	8.1	8.5	8.9											
	-15	4.2	4.8	5.0	5.2	5.5	5.3	6.0	6.3	6.6	6.9	5.7	6.5	6.8	7.1	7.5	6.0	6.8	7.1	7.5	7.9	6.8	7.7	8.1	8.5	8.9											
	-10	4.3	4.8	5.0	5.2	5.5	5.3	6.0	6.3	6.6	6.9	5.8	6.5	6.8	7.1	7.5	6.0	6.8	7.1	7.5	7.9	6.8	7.7	8.1	8.5	8.9											
	-5	4.1	4.7	4.9	5.1	5.3	5.2	5.9	6.2	6.4	6.7	5.6	6.4	6.6	7.0	7.3	5.9	6.7	7.0	7.3	7.7	6.7	7.6	7.9	8.3	8.7											
	0	4.0	4.5	4.7	4.9	5.1	5.1	5.7	6.0	6.2	6.5	5.5	6.2	6.5	6.8	7.1	5.8	6.5	6.8	7.1	7.5	6.5	7.4	7.7	8.1	8.5											
	5	3.2	3.6	3.8	3.9	4.1	4.2	4.8	5.0	5.2	5.4	4.6	5.2	5.4	5.7	5.9	4.9	5.5	5.7	6.0	6.3	5.6	6.3	6.6	6.9	7.3											
	10	2.3	2.6	2.7	2.8	3.0	3.3	3.7	3.8	4.0	4.2	3.6	4.1	4.3	4.5	4.7	3.9	4.4	4.6	4.8	5.0	4.6	5.1	5.4	5.6	5.9											
30	-35	4.3	4.8	5.0	5.3	5.5	5.4	6.1	6.3	6.6	7.0	5.8	6.5	6.8	7.2	7.5	6.0	6.9	7.2	7.5	7.9	6.8	7.8	8.1	8.5	9.0											
	-30	4.3	4.8	5.0	5.3	5.5	5.4	6.1	6.3	6.6	7.0	5.8	6.5	6.8	7.2	7.5	6.1	6.9	7.2	7.5	7.9	6.8	7.7	8.1	8.5	9.0											
	-25	4.3	4.8	5.0	5.2	5.5	5.4	6.1	6.3	6.6	7.0	5.8	6.5	6.8	7.2	7.5	6.1	6.9	7.2	7.5	7.9	6.8	7.7	8.1	8.5	9.0											
	-20	4.3	4.8	5.0	5.2	5.5	5.4	6.1	6.3	6.6	7.0	5.8	6.5	6.8	7.2	7.5	6.1	6.9	7.2	7.5	7.9	6.8	7.7	8.1	8.5	8.9											
	-15	4.3	4.8	5.0	5.2	5.5	5.4	6.1	6.3	6.6	7.0	5.8	6.5	6.8	7.2	7.5	6.1	6.9	7.2	7.5	7.9	6.8	7.8	8.1	8.5	8.9											
	-10	4.3	4.8	5.0	5.2	5.4	5.4	6.0	6.3	6.6	6.9	5.8	6.5	6.8	7.1	7.5	6.1	6.8	7.1	7.5	7.8	6.8	7.7	8.1	8.5	8.9											
	-5	4.1	4.6	4.7	5.0	5.2	5.1	5.8	6.0	6.3	6.6	5.6	6.3	6.5	6.8	7.2	5.8	6.6	6.9	7.2	7.5	6.6	7.5	7.8	8.2	8.6											
	0	3.7	4.2	4.3	4.5	4.7	4.8	5.4	5.6	5.8	6.1	5.2	5.8	6.1	6.3	6.6	5.4	6.1	6.4	6.7	7.0	6.2	7.0	7.3	7.6	8.0											
	5	2.7	3.1	3.2	3.3	3.5	3.7	4.2	4.3	4.5	4.7	4.1	4.6	4.8	5.0	5.2	4.3	4.9	5.1	5.3	5.6	5.0	5.7	5.9	6.2	6.5											
	10	1.9	2.1	2.2	2.3	2.4	2.8	3.1	3.3	3.4	3.6	3.1	3.5	3.7	3.8	4.0	3.4	3.8	4.0	4.1	4.3	4.0	4.5	4.7	5.0	5.2											
40	-35	4.3	4.9	5.1	5.3	5.6	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.9	7.8	8.2	8.6	9.0											
	-30	4.3	4.9	5.1	5.3	5.5	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.6	6.1	6.9	7.2	7.6	8.0	6.9	7.8	8.2	8.6	9.0											
	-25	4.3	4.9	5.1	5.3	5.5	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.5	6.1	6.9	7.2	7.6	7.9	6.9	7.8	8.1	8.5	9.0											
	-20	4.3	4.9	5.1	5.3	5.5	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.5	6.1	6.9	7.2	7.6	7.9	6.9	7.8	8.2	8.5	9.0											
	-15	4.3	4.9	5.1	5.3	5.5	5.4	6.1	6.4	6.7	7.0	5.8	6.6	6.9	7.2	7.5	6.1	6.9	7.2	7.6	7.9	6.9	7.8	8.2	8.5	9.0											
	-10	4.2	4.7	4.9	5.1	5.3	5.3	5.9	6.2	6.5	6.8	5.7	6.4	6.7	7.0	7.3	6.0	6.7	7.0	7.4	7.7	6.7	7.6	8.0	8.3	8.7											
	-5	4.0	4.4	4.6	4.8	5.0	5.0	5.6	5.9	6.1	6.4	5.4	6.1	6.4	6.7	7.0	5.7	6.4	6.7	7.0	7.3	6.5	7.3	7.6	8.0	8.4											
	0	3.2	3.6	3.8	3.9	4.1	4.2	4.8	5.0	5.2	5.4	4.6	5.2	5.4	5.7	5.9	4.9	5.5	5.7	6.0	6.3	5.6	6.3	6.6	6.9	7.2											
	5	2.3	2.5	2.6	2.8	2.9	3.2	3.6	3.8	3.9	4.1	3.6	4.0	4.2	4.4	4.6	3.8	4.3	4.5	4.7	4.9	4.5	5.1	5.3	5.5	5.8											
	10	1.5	1.6	1.7	1.8	1.8	2.3	2.6	2.7	2.8	3.0	2.7	3.0	3.1	3.3	3.4	2.9	3.3	3.4	3.6	3.7	3.5	4.0	4.1	4.3	4.5											
50	-35	4.4	4.9	5.1	5.3	5.6	5.5	6.2	6.4	6.7	7.1	5.9	6.6	6.9	7.3	7.6	6.2	7.0	7.3	7.6	8.0	6.9	7.														



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																													
		10000						9500						9000						8500						8000					
		WIND KNOTS						WIND KNOTS						WIND KNOTS						WIND KNOTS						WIND KNOTS					
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-35	7.8	8.9	9.4	9.9	10.5	8.7	10.0	10.6	11.2	11.8	9.7	11.2	11.9	12.6	13.4	10.9	12.6	13.3	14.2	15.1	12.1	14.2	15.0	16.0	17.1	12.1	14.2	15.0	15.9	17.0
	-30	7.8	8.9	9.4	9.9	10.5	8.7	10.0	10.5	11.1	11.8	9.7	11.2	11.9	12.5	13.3	10.9	12.6	13.3	14.1	15.0	12.1	14.2	15.0	15.9	17.0	12.2	14.2	15.0	15.9	17.0
	-25	7.8	8.9	9.4	9.9	10.4	8.7	10.0	10.5	11.1	11.8	9.7	11.2	11.9	12.5	13.3	10.9	12.6	13.3	14.1	15.0	12.2	14.2	15.0	15.9	17.0	12.2	14.2	15.0	15.9	17.0
	-20	7.8	8.9	9.4	9.9	10.4	8.7	10.0	10.5	11.1	11.8	9.8	11.2	11.9	12.5	13.3	10.9	12.6	13.3	14.1	15.0	12.2	14.2	15.0	15.9	17.0	12.2	14.2	15.0	15.9	17.0
	-15	7.8	8.9	9.4	9.9	10.4	8.7	10.0	10.5	11.1	11.8	9.8	11.3	11.9	12.5	13.3	10.9	12.6	13.3	14.1	15.0	12.2	14.2	15.0	15.9	16.9	12.2	14.2	15.0	15.9	16.9
	-10	7.8	8.9	9.4	9.9	10.4	8.8	10.0	10.6	11.1	11.8	9.8	11.3	11.9	12.5	13.3	11.0	12.6	13.3	14.1	15.0	12.2	14.2	15.0	15.9	16.9	12.3	14.2	15.0	15.9	16.9
	-5	7.9	9.0	9.4	9.9	10.4	8.8	10.1	10.6	11.1	11.8	9.8	11.3	11.9	12.5	13.3	11.0	12.7	13.3	14.1	15.0	12.3	14.2	15.0	15.9	16.9	12.3	14.2	15.0	15.9	16.9
	0	7.7	8.8	9.2	9.7	10.2	8.6	9.9	10.4	10.9	11.5	9.7	11.1	11.7	12.3	13.0	10.8	12.5	13.1	13.9	14.7	12.1	14.0	14.8	15.6	16.6	12.1	14.0	14.8	15.6	16.6
	5	7.6	8.6	9.0	9.5	10.0	8.5	9.7	10.2	10.7	11.3	9.5	10.9	11.5	12.1	12.8	10.7	12.3	12.9	13.6	14.4	11.9	13.8	14.5	15.4	16.3	11.9	13.8	14.5	15.4	16.3
	10	6.4	7.3	7.6	8.0	8.5	7.3	8.3	8.7	9.2	9.7	8.2	9.4	9.9	10.4	11.0	9.3	10.7	11.2	11.9	12.6	10.5	12.1	12.8	13.5	14.3	10.5	12.1	12.8	13.5	14.3
	10	-35	7.6	8.8	9.2	9.7	10.3	8.6	9.9	10.4	11.0	11.6	9.6	11.1	11.7	12.3	13.1	10.7	12.4	13.1	13.9	14.8	12.0	14.0	14.8	15.7	16.8	12.0	14.0	14.8	15.7
-30		7.6	8.8	9.2	9.7	10.2	8.6	9.8	10.4	10.9	11.6	9.6	11.1	11.7	12.3	13.1	10.7	12.4	13.1	13.9	14.8	12.0	14.0	14.8	15.7	16.7	12.0	14.0	14.8	15.7	16.7
-25		7.7	8.8	9.2	9.7	10.2	8.6	9.8	10.4	10.9	11.6	9.6	11.1	11.7	12.3	13.0	10.7	12.4	13.1	13.9	14.7	12.0	14.0	14.8	15.6	16.6	12.0	14.0	14.8	15.6	16.6
-20		7.7	8.8	9.2	9.7	10.2	8.6	9.9	10.4	10.9	11.5	9.6	11.1	11.6	12.3	13.0	10.8	12.4	13.1	13.9	14.7	12.0	14.0	14.8	15.6	16.6	12.1	14.0	14.8	15.6	16.6
-15		7.7	8.8	9.2	9.7	10.2	8.6	9.9	10.4	10.9	11.5	9.6	11.1	11.7	12.3	13.0	10.8	12.4	13.1	13.9	14.7	12.1	14.0	14.8	15.6	16.6	12.1	14.0	14.8	15.6	16.6
-10		7.7	8.8	9.2	9.7	10.2	8.6	9.9	10.4	10.9	11.5	9.7	11.1	11.7	12.3	13.0	10.8	12.5	13.1	13.9	14.7	12.1	14.0	14.8	15.6	16.6	12.1	14.0	14.8	15.6	16.6
-5		7.7	8.7	9.1	9.6	10.1	8.6	9.8	10.3	10.8	11.4	9.6	11.0	11.6	12.2	12.9	10.8	12.4	13.0	13.8	14.6	12.0	13.9	14.7	15.5	16.5	12.0	13.9	14.7	15.5	16.5
0		7.5	8.5	9.0	9.4	9.9	8.4	9.6	10.1	10.6	11.2	9.5	10.8	11.4	12.0	12.7	10.6	12.2	12.8	13.5	14.3	11.9	13.7	14.4	15.3	16.2	11.9	13.7	14.4	15.3	16.2
5		7.0	7.9	8.3	8.7	9.2	7.9	9.0	9.4	9.9	10.4	8.8	10.1	10.6	11.2	11.8	9.9	11.4	12.0	12.7	13.4	11.2	12.9	13.6	14.3	15.2	11.2	12.9	13.6	14.3	15.2
10		5.8	6.6	6.9	7.3	7.7	6.7	7.6	8.0	8.4	8.8	7.6	8.7	9.1	9.6	10.1	8.6	9.9	10.4	11.0	11.6	9.8	11.3	11.9	12.5	13.3	9.8	11.3	11.9	12.5	13.3
20		-35	7.6	8.7	9.1	9.6	10.1	8.5	9.8	10.3	10.8	11.5	9.5	11.0	11.6	12.2	12.9	10.7	12.3	13.0	13.8	14.6	11.9	13.9	14.7	15.6	16.6	11.9	13.9	14.7	15.6
	-30	7.6	8.7	9.1	9.6	10.1	8.5	9.8	10.3	10.8	11.4	9.5	11.0	11.6	12.2	12.9	10.7	12.3	13.0	13.7	14.6	11.9	13.9	14.6	15.5	16.5	11.9	13.9	14.6	15.5	16.5
	-25	7.6	8.7	9.1	9.6	10.1	8.5	9.8	10.2	10.8	11.4	9.5	11.0	11.5	12.2	12.9	10.7	12.3	13.0	13.7	14.6	11.9	13.8	14.6	15.5	16.5	11.9	13.8	14.6	15.5	16.5
	-20	7.6	8.7	9.1	9.6	10.1	8.5	9.8	10.2	10.8	11.4	9.6	11.0	11.5	12.2	12.9	10.7	12.3	13.0	13.7	14.5	12.0	13.9	14.6	15.5	16.4	12.0	13.9	14.6	15.5	16.4
	-15	7.6	8.7	9.1	9.6	10.1	8.6	9.8	10.3	10.8	11.4	9.6	11.0	11.5	12.2	12.9	10.7	12.3	13.0	13.7	14.5	12.0	13.9	14.6	15.5	16.4	12.0	13.9	14.6	15.5	16.4
	-10	7.7	8.7	9.1	9.6	10.1	8.6	9.8	10.3	10.8	11.4	9.6	11.0	11.6	12.2	12.9	10.8	12.4	13.0	13.7	14.5	12.0	13.9	14.6	15.5	16.4	12.0	13.9	14.6	15.5	16.4
	-5	7.5	8.5	8.9	9.4	9.9	8.4	9.6	10.1	10.6	11.2	9.5	10.8	11.4	12.0	12.6	10.6	12.2	12.8	13.5	14.3	11.9	13.7	14.4	15.2	16.2	11.9	13.7	14.4	15.2	16.2
	0	7.3	8.3	8.7	9.2	9.6	8.3	9.4	9.8	10.3	10.9	9.3	10.6	11.1	11.7	12.3	10.4	11.9	12.5	13.2	14.0	11.7	13.4	14.1	14.9	15.8	11.7	13.4	14.1	14.9	15.8
	5	6.4	7.2	7.6	7.9	8.3	7.2	8.2	8.6	9.0	9.5	8.2	9.3	9.8	10.3	10.9	9.3	10.6	11.1	11.7	12.4	10.4	12.0	12.6	13.3	14.1	10.4	12.0	12.6	13.3	14.1
	10	5.3	6.0	6.3	6.6	6.9	6.1	6.9	7.2	7.6	8.0	7.0	8.0	8.3	8.8	9.2	8.0	9.1	9.6	10.1	10.6	9.1	10.4	11.0	11.6	12.2	9.1	10.4	11.0	11.6	12.2
	30	-35	7.6	8.7	9.2	9.6	10.2	8.6	9.8	10.3	10.9	11.5	9.6	11.0	11.6	12.2	13.0	10.7	12.4	13.1	13.8	14.6	12.0	13.9	14.7	15.6	16.6	12.0	13.9	14.7	15.6
-30		7.7	8.7	9.2	9.6	10.1	8.6	9.8	10.3	10.8	11.5	9.6	11.0	11.6	12.2	12.9	10.7	12.4	13.0	13.8	14.6	12.0	13.9	14.7	15.5	16.5	12.0	13.9	14.7	15.5	16.5
-25		7.7	8.7	9.1	9.6	10.1	8.6	9.8	10.3	10.8	11.4	9.6	11.0	11.6	12.2	12.9	10.8	12.4	13.0	13.8	14.6	12.0	13.9	14.7	15.5	16.5	12.0	13.9	14.7	15.5	16.5
-20		7.7	8.7	9.1	9.6	10.1	8.6	9.8	10.3	10.8	11.4	9.6	11.0	11.6	12.2	12.9	10.8	12.4	13.0	13.7	14.6	12.0	13.9	14.7	15.5	16.5	12.0	13.9	14.7	15.5	16.5
-15		7.7	8.7	9.2	9.6	10.1	8.6	9.8	10.3	10.8	11.4	9.6	11.0	11.6	12.2	12.9	10.8	12.4	13.0	13.7	14.5	12.1	13.9	14.7	15.5	16.4	12.1	13.9	14.7	15.5	16.4
-10		7.7	8.7	9.1	9.5	10.0	8.6	9.8	10.2	10.8	11.3	9.6	11.0	11.5	12.1	12.8	10.8	12.3	13.0	13.7	14.5	12.0	13.9	14.6	15.4	16.3	12.0	13.9	14.6	15.4	16.3
-5		7.4	8.4	8.8	9.2	9.7	8.3	9.5	9.9	10.4	11.0	9.4	10.7	11.2	11.8	12.4	10.5	12.0	12.6	13.3	14.0	11.7	13.5	14.2	15.0	15.9	11.7	13.5	14.2	15.0	15.9
0		7.0	7.9	8.3	8.7	9.1	7.9	9.0	9.4	9.8	10.4	8.9	10.1	10.6	11.2	11.8	10.0	11.4	12.0	12.6	13.3	11.2	12.9	13.6	14.3	15.1	11.2	12.9	13.6	14.3	15.1
5		5.8	6.5	6.8	7.2	7.5	6.6	7.5	7.8	8.2	8.7	7.5	8.6	9.0	9.4	9.9	8.6	9.8	10.3	10.8	11.4	9.7	11.1	11.7	12.3	13.0	9.7	11.1	11.7	12.3	13.0
10		4.7	5.3	5.6	5.9	6.1	5.5	6.2	6.5	6.8	7.2	6.4	7.2	7.6	8.0	8.4	7.3	8.4	8.8	9.2	9.7	8.4	9.6	10.1	10.7	11.3	8.4	9.6	10.1	10.7	11.3
40		-35	7.7	8.8	9.2	9.7	10.2	8.6	9.9	10.4	10.9	11.5	9.7	11.1	11.6	12.3	13.0	10.8	12.4	13.1	13.8	14.6	12.1	14.0	14.7	15.6	16.6	12.1	14.0	14.7	15.6
	-30	7.7	8.8	9.2	9.7	10.2	8.6	9.9	10.3	10.9																					



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																			
		*12375					11500					11200					11000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
6	-35	4.4	4.9	5.1	5.4	5.6	5.5	6.2	6.5	6.8	7.1	5.9	6.7	7.0	7.3	7.7	6.2	7.0	7.3	7.7	8.1
0	-30	4.4	4.9	5.1	5.3	5.6	5.5	6.2	6.5	6.8	7.1	5.9	6.7	7.0	7.3	7.6	6.2	7.0	7.3	7.7	8.0
0	-25	4.4	4.9	5.1	5.3	5.6	5.5	6.2	6.5	6.8	7.1	5.9	6.7	7.0	7.3	7.6	6.2	7.0	7.3	7.6	8.0
0	-20	4.4	4.9	5.1	5.3	5.6	5.5	6.2	6.5	6.7	7.1	5.9	6.7	7.0	7.3	7.6	6.2	7.0	7.3	7.6	8.0
0	-15	4.3	4.8	5.0	5.2	5.4	5.4	6.0	6.3	6.6	6.9	5.8	6.5	6.8	7.1	7.4	6.1	6.8	7.1	7.5	7.8
0	-10	3.9	4.4	4.5	4.7	4.9	5.0	5.6	5.8	6.1	6.4	5.4	6.1	6.3	6.6	6.9	5.7	6.4	6.7	7.0	7.3
0	-5	3.3	3.7	3.8	4.0	4.1	4.3	4.9	5.1	5.3	5.5	4.7	5.3	5.5	5.8	6.0	5.0	5.6	5.8	6.1	6.4
0	0	2.3	2.5	2.6	2.7	2.8	3.2	3.6	3.8	3.9	4.1	3.6	4.0	4.2	4.4	4.6	3.8	4.3	4.5	4.7	4.9
0	5	1.4	1.5	1.6	1.7	1.7	2.3	2.5	2.6	2.8	2.9	2.6	2.9	3.0	3.2	3.3	2.8	3.2	3.3	3.5	3.6
0	10	.6	.7	.7	.7	.8	1.5	1.6	1.7	1.8	1.8	1.8	2.0	2.1	2.1	2.2	2.0	2.2	2.3	2.4	2.5
7	-35	4.4	4.9	5.1	5.3	5.5	5.5	6.2	6.4	6.7	7.0	5.9	6.7	6.9	7.3	7.6	6.2	7.0	7.3	7.6	8.0
0	-30	4.3	4.9	5.0	5.3	5.5	5.5	6.1	6.4	6.7	7.0	5.9	6.6	6.9	7.2	7.5	6.2	7.0	7.3	7.6	7.9
0	-25	4.3	4.8	5.0	5.2	5.4	5.4	6.1	6.3	6.6	6.9	5.8	6.6	6.8	7.1	7.5	6.1	6.9	7.2	7.5	7.9
0	-20	4.3	4.7	4.9	5.1	5.4	5.4	6.0	6.3	6.5	6.8	5.8	6.5	6.8	7.1	7.4	6.1	6.8	7.1	7.4	7.8
0	-15	4.0	4.5	4.6	4.8	5.0	5.1	5.7	5.9	6.2	6.5	5.5	6.2	6.4	6.7	7.0	5.8	6.5	6.8	7.1	7.4
0	-10	3.7	4.1	4.3	4.4	4.6	4.8	5.3	5.5	5.8	6.0	5.2	5.8	6.0	6.3	6.6	5.5	6.1	6.4	6.6	6.9
0	-5	2.8	3.1	3.2	3.3	3.5	3.8	4.2	4.4	4.6	4.8	4.2	4.7	4.9	5.1	5.3	4.4	5.0	5.2	5.4	5.6
0	0	1.8	2.0	2.0	2.1	2.2	2.7	3.0	3.1	3.3	3.4	3.1	3.4	3.6	3.7	3.9	3.3	3.7	3.9	4.0	4.2
0	5	.9	1.0	1.1	1.1	1.2	1.8	2.0	2.1	2.2	2.3	2.1	2.4	2.5	2.6	2.7	2.4	2.6	2.8	2.9	3.0
0	10	.2	.2	.2	.2	.3	1.0	1.1	1.2	1.2	1.3	1.3	1.5	1.5	1.6	1.7	1.5	1.7	1.8	1.9	1.9
8	-35	4.3	4.8	5.0	5.2	5.4	5.4	6.1	6.3	6.6	6.9	5.8	6.5	6.8	7.1	7.5	6.1	6.9	7.2	7.5	7.8
0	-30	4.3	4.7	4.9	5.1	5.4	5.4	6.0	6.3	6.5	6.8	5.8	6.5	6.8	7.1	7.4	6.1	6.8	7.1	7.4	7.8
0	-25	4.2	4.7	4.9	5.1	5.3	5.3	6.0	6.2	6.5	6.8	5.8	6.4	6.7	7.0	7.3	6.1	6.8	7.1	7.4	7.7
0	-20	4.1	4.6	4.8	5.0	5.2	5.2	5.8	6.1	6.3	6.6	5.7	6.3	6.6	6.9	7.2	6.0	6.7	6.9	7.2	7.6
0	-15	3.7	4.2	4.3	4.5	4.7	4.8	5.4	5.6	5.8	6.1	5.2	5.8	6.1	6.3	6.6	5.5	6.2	6.4	6.7	7.0
0	-10	3.3	3.6	3.8	3.9	4.1	4.3	4.8	5.0	5.2	5.4	4.7	5.2	5.5	5.7	5.9	5.0	5.6	5.8	6.0	6.3
0	-5	2.3	2.5	2.6	2.7	2.8	3.3	3.6	3.8	3.9	4.1	3.6	4.1	4.2	4.4	4.6	3.9	4.3	4.5	4.7	4.9
0	0	1.3	1.5	1.5	1.6	1.6	2.2	2.5	2.6	2.7	2.8	2.6	2.9	3.0	3.1	3.2	2.8	3.1	3.3	3.4	3.5
0	5	.5	.6	.6	.6	.6	1.4	1.5	1.6	1.6	1.7	1.7	1.9	1.9	2.0	2.1	1.9	2.1	2.2	2.3	2.4
0	10	-.2	-.2	-.2	-.2	-.2	.6	.7	.7	.7	.7	.9	1.0	1.0	1.1	1.1	1.1	1.2	1.3	1.3	1.4
9	-35	4.1	4.5	4.7	4.9	5.1	5.2	5.8	6.0	6.3	6.6	5.6	6.3	6.5	6.8	7.1	5.9	6.6	6.9	7.2	7.5
0	-30	4.0	4.4	4.6	4.8	5.0	5.1	5.6	5.9	6.1	6.4	5.5	6.1	6.4	6.6	6.9	5.8	6.4	6.7	7.0	7.3
0	-25	3.8	4.3	4.4	4.6	4.8	4.9	5.5	5.7	5.9	6.2	5.3	6.0	6.2	6.5	6.7	5.6	6.3	6.5	6.8	7.1
0	-20	3.4	3.8	4.0	4.1	4.3	4.5	5.0	5.2	5.4	5.6	4.9	5.5	5.7	5.9	6.2	5.2	5.8	6.0	6.3	6.5
0	-15	2.8	3.1	3.2	3.4	3.5	3.8	4.3	4.4	4.6	4.8	4.2	4.7	4.9	5.1	5.3	4.5	5.0	5.2	5.4	5.7
0	-10	2.1	2.3	2.4	2.5	2.6	3.0	3.4	3.5	3.6	3.8	3.4	3.8	3.9	4.1	4.3	3.6	4.1	4.2	4.4	4.6
0	-5	1.2	1.3	1.4	1.4	1.5	2.1	2.3	2.4	2.5	2.6	2.4	2.7	2.8	2.9	3.0	2.6	2.9	3.1	3.2	3.3
0	0	.3	.4	.4	.4	.4	1.2	1.3	1.4	1.4	1.5	1.5	1.7	1.7	1.8	1.9	1.7	1.9	2.0	2.1	2.1
0	5	-.4	-.4	-.4	-.4	-.5	.4	.5	.5	.5	.5	.7	.8	.8	.8	.9	.9	1.0	1.0	1.1	1.1
0	10	-1.0	-1.1	-1.1	-1.2	-1.2	-.3	-.3	-.3	-.3	-.3	.0	.0	.0	.0	.0	.2	.2	.2	.2	.2
1	-35	3.8	4.2	4.4	4.6	4.8	4.9	5.5	5.7	5.9	6.2	5.3	5.9	6.2	6.4	6.7	5.6	6.3	6.5	6.8	7.1
0	-30	3.6	4.0	4.2	4.3	4.5	4.7	5.2	5.4	5.7	5.9	5.1	5.7	5.9	6.2	6.4	5.4	6.0	6.3	6.5	6.8
0	-25	3.4	3.8	4.0	4.1	4.3	4.5	5.0	5.2	5.4	5.6	4.9	5.5	5.7	5.9	6.2	5.2	5.8	6.0	6.3	6.5
0	-20	2.7	3.0	3.1	3.2	3.4	3.7	4.1	4.3	4.5	4.7	4.1	4.6	4.7	4.9	5.2	4.4	4.9	5.1	5.3	5.5
0	-15	2.0	2.2	2.3	2.4	2.4	2.9	3.3	3.4	3.5	3.7	3.3	3.7	3.8	4.0	4.1	3.5	3.9	4.1	4.3	4.4
0	-10	1.0	1.1	1.2	1.2	1.3	1.9	2.1	2.2	2.3	2.4	2.2	2.5	2.6	2.7	2.8	2.5	2.7	2.9	3.0	3.1
0	-5	.2	.2	.2	.2	.2	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.6	1.5	1.7	1.7	1.8	1.9
0	0	-.5	-.6	-.6	-.7	-.7	.2	.2	.2	.3	.3	.5	.6	.6	.6	.6	.7	.8	.8	.8	.9
0	5	-1.2	-1.3	-1.4	-1.4	-1.5	-.5	-.5	-.5	-.6	-.6	-.2	-.2	-.2	-.2	-.3	.0	.0	.0	.0	.0
0	10	-1.8	-1.9	-2.0	-2.1	-2.2	-1.1	-1.2	-1.2	-1.3	-1.3	-.8	-.9	-1.0	-1.0	-1.0	-.7	-.7	-.7	-.8	-.8
1	-35	3.4	3.7	3.9	4.0	4.2	4.4	4.9	5.1	5.3	5.5	4.8	5.4	5.6	5.8	6.1	5.1	5.7	5.9	6.2	6.4
0	-30	3.2	3.5	3.7	3.8	3.9	4.2	4.7	4.9	5.1	5.3	4.6	5.1	5.3	5.6	5.8	4.9	5.4	5.7	5.9	6.1
0	-25	2.8	3.1	3.3	3.4	3.5	3.9	4.3	4.4	4.6	4.8	4.2	4.7	4.9	5.1	5.3	4.5	5.0	5.2	5.4	5.7
0	-20	2.2	2.5	2.6	2.7	2.8	3.2	3.6	3.7	3.9	4.0	3.6	4.0	4.1	4.3	4.5	3.8	4.3	4.4	4.6	4.8
0	-15	1.5	1.7	1.7	1.8	1.9	2.4	2.7	2.8	2.9	3.0	2.8	3.1	3.2	3.3	3.5	3.0	3.4	3.5	3.6	3.8
0	-10	.6	.7	.7	.7	.7	1.4	1.6	1.7	1.7	1.8	1.8	2.0	2.0	2.1	2.2	2.0	2.2	2.3	2.4	2.5
0	-5	-.2	-.3	-.3	-.3	-.3	.6	.6	.6	.7	.7	.9	.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3
0	0	-.9	-1.0	-1.1	-1.1	-1.1	-.2	-.2	-.2	-.2	-.2	.1	.1	.1	.1	.1	.3	.3	.3	.3	.4
0	5	-1.5	-1.7	-1.7	-1.8	-1.9	-.8	-.9	-1.0	-1.0	-1.0	-.6	-.6	-.7	-.7	-.7	-.4	-.4	-.5	-.5	-.5
0	10	-2.1	-2.3	-2.4	-2.5	-2.6	-1.4	-1.6	-1.7	-1.7	-1.8	-1.2	-1.3	-1.4	-1.4	-1.5	-1.0	-1.1	-1.2	-1.2	-1.3

\*FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A HEIGHT IN EXCESS OF MAXIMUM  
DESIGN LANDING WEIGHT OF 11500 POUNDS

Figure 4-49 (Sheet 3)



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
6000	-35	7.8	8.9	9.3	9.8	10.3	8.8	10.0	10.5	11.0	11.6	9.8	11.2	11.7	12.3	13.0	11.0	12.6	13.2	13.9	14.7
	-30	7.8	8.9	9.3	9.7	10.2	8.8	10.0	10.4	11.0	11.5	9.8	11.2	11.7	12.3	13.0	11.0	12.5	13.2	13.9	14.7
	-25	7.8	8.9	9.3	9.7	10.2	8.8	10.0	10.4	10.9	11.5	9.8	11.2	11.7	12.3	13.0	11.0	12.5	13.2	13.9	14.6
	-20	7.9	8.9	9.3	9.7	10.2	8.8	10.0	10.4	10.9	11.5	9.8	11.2	11.7	12.3	13.0	11.0	12.5	13.2	13.8	14.6
	-15	7.7	8.7	9.1	9.5	10.0	8.6	9.8	10.2	10.7	11.3	9.7	11.0	11.5	12.1	12.7	10.8	12.3	12.9	13.6	14.3
	-10	7.3	8.2	8.6	9.0	9.4	8.2	9.2	9.7	10.1	10.6	9.2	10.4	10.9	11.4	12.0	10.3	11.7	12.3	12.9	13.6
	-5	6.5	7.3	7.6	8.0	8.4	7.4	8.3	8.7	9.1	9.6	8.3	9.4	9.9	10.4	10.9	9.4	10.7	11.2	11.8	12.4
	0	5.2	5.9	6.1	6.4	6.7	6.0	6.8	7.1	7.4	7.8	6.9	7.8	8.2	8.6	9.0	7.9	9.0	9.4	9.9	10.4
	5	4.1	4.7	4.9	5.1	5.3	4.9	5.5	5.7	6.0	6.3	5.7	6.5	6.8	7.1	7.4	6.6	7.5	7.9	8.3	8.7
	10	3.2	3.6	3.7	3.9	4.1	3.9	4.4	4.6	4.8	5.0	4.7	5.3	5.5	5.8	6.1	5.5	6.3	6.6	6.9	7.2
7000	-35	7.8	8.9	9.3	9.7	10.2	8.8	9.9	10.4	10.9	11.5	9.8	11.2	11.7	12.3	12.9	10.9	12.5	13.1	13.8	14.6
	-30	7.8	8.8	9.2	9.7	10.1	8.7	9.9	10.4	10.9	11.4	9.8	11.1	11.6	12.2	12.9	10.9	12.5	13.1	13.8	14.5
	-25	7.7	8.7	9.1	9.6	10.0	8.7	9.8	10.3	10.8	11.3	9.7	11.0	11.6	12.1	12.8	10.9	12.4	13.0	13.7	14.4
	-20	7.7	8.7	9.1	9.5	9.9	8.6	9.8	10.2	10.7	11.2	9.7	11.0	11.5	12.0	12.7	10.8	12.3	12.9	13.5	14.3
	-15	7.4	8.3	8.7	9.1	9.5	8.3	9.4	9.8	10.3	10.8	9.3	10.6	11.0	11.6	12.2	10.4	11.9	12.4	13.1	13.8
	-10	7.0	7.9	8.2	8.6	9.0	7.9	8.9	9.3	9.7	10.2	8.9	10.1	10.5	11.0	11.6	10.0	11.3	11.9	12.5	13.1
	-5	5.9	6.6	6.9	7.2	7.6	6.7	7.6	7.9	8.3	8.7	7.7	8.7	9.0	9.5	10.0	8.7	9.9	10.3	10.8	11.4
	0	4.7	5.2	5.4	5.7	6.0	5.4	6.1	6.4	6.7	7.0	6.3	7.1	7.4	7.8	8.1	7.2	8.2	8.6	9.0	9.5
	5	3.6	4.1	4.2	4.4	4.6	4.3	4.9	5.1	5.3	5.6	5.1	5.8	6.1	6.3	6.6	6.0	6.8	7.1	7.5	7.9
	10	2.7	3.0	3.2	3.3	3.5	3.4	3.8	4.0	4.2	4.3	4.1	4.7	4.9	5.1	5.3	5.0	5.6	5.9	6.2	6.5
8000	-35	7.8	8.8	9.2	9.6	10.1	8.7	9.8	10.3	10.8	11.3	9.7	11.1	11.6	12.2	12.8	10.9	12.4	13.0	13.7	14.4
	-30	7.7	8.7	9.1	9.5	10.0	8.7	9.8	10.2	10.7	11.3	9.7	11.0	11.5	12.1	12.7	10.8	12.3	13.0	13.6	14.3
	-25	7.7	8.7	9.0	9.4	9.9	8.6	9.7	10.2	10.6	11.2	9.6	10.9	11.4	12.0	12.6	10.8	12.3	12.9	13.5	14.2
	-20	7.6	8.5	8.9	9.3	9.7	8.5	9.6	10.0	10.5	11.0	9.5	10.8	11.3	11.8	12.4	10.7	12.1	12.7	13.3	14.0
	-15	7.1	8.0	8.3	8.7	9.1	8.0	9.0	9.4	9.8	10.3	9.0	10.2	10.6	11.1	11.7	10.1	11.5	12.0	12.6	13.2
	-10	6.5	7.3	7.6	7.9	8.3	7.4	8.3	8.7	9.0	9.5	8.3	9.4	9.8	10.3	10.8	9.4	10.6	11.1	11.7	12.3
	-5	5.3	5.9	6.2	6.5	6.8	6.1	6.9	7.2	7.5	7.8	7.0	7.9	8.3	8.6	9.1	8.0	9.1	9.5	9.9	10.4
	0	4.1	4.6	4.8	5.0	5.2	4.9	5.5	5.7	6.0	6.2	5.7	6.4	6.7	7.0	7.3	6.6	7.5	7.8	8.2	8.6
	5	3.1	3.5	3.6	3.8	3.9	3.8	4.3	4.4	4.6	4.9	4.6	5.1	5.4	5.6	5.9	5.4	6.1	6.4	6.7	7.0
	10	2.2	2.5	2.6	2.7	2.8	2.9	3.2	3.4	3.5	3.7	3.5	4.1	4.2	4.4	4.6	4.4	5.0	5.2	5.4	5.7
9000	-35	7.5	8.5	8.8	9.3	9.7	8.4	9.5	10.0	10.4	11.0	9.5	10.7	11.2	11.8	12.4	10.6	12.1	12.7	13.3	14.0
	-30	7.4	8.3	8.7	9.0	9.5	8.3	9.4	9.8	10.2	10.7	9.3	10.5	11.0	11.5	12.1	10.4	11.9	12.4	13.0	13.7
	-25	7.2	8.1	8.5	8.8	9.3	8.1	9.2	9.6	10.0	10.5	9.1	10.3	10.8	11.3	11.9	10.3	11.6	12.2	12.8	13.4
	-20	6.7	7.5	7.9	8.2	8.6	7.6	8.6	8.9	9.3	9.8	8.6	9.7	10.1	10.6	11.1	9.7	11.0	11.5	12.0	12.6
	-15	6.0	6.7	7.0	7.3	7.6	6.8	7.7	8.0	8.4	8.8	7.7	8.7	9.1	9.6	10.0	8.8	9.9	10.4	10.9	11.5
	-10	5.1	5.7	5.9	6.2	6.4	5.8	6.6	6.8	7.2	7.5	6.7	7.6	7.9	8.3	8.7	7.7	8.7	9.1	9.5	10.0
	-5	4.0	4.4	4.6	4.8	5.0	4.7	5.3	5.5	5.7	6.0	5.5	6.2	6.5	6.8	7.1	6.4	7.2	7.6	7.9	8.3
	0	2.9	3.3	3.4	3.5	3.7	3.6	4.0	4.2	4.4	4.6	4.4	4.9	5.1	5.3	5.6	5.2	5.9	6.1	6.4	6.7
	5	2.0	2.3	2.4	2.5	2.6	2.7	3.0	3.1	3.3	3.4	3.4	3.8	4.0	4.1	4.3	4.2	4.7	4.9	5.1	5.4
	10	1.3	1.4	1.5	1.5	1.6	1.9	2.1	2.2	2.3	2.4	2.5	2.8	3.0	3.1	3.2	3.3	3.7	3.8	4.0	4.2
10000	-35	7.2	8.1	8.4	8.8	9.2	8.1	9.1	9.6	10.0	10.5	9.1	10.3	10.8	11.3	11.9	10.3	11.6	12.2	12.8	13.5
	-30	7.0	7.8	8.2	8.5	8.9	7.9	8.9	9.3	9.7	10.1	8.9	10.0	10.5	11.0	11.5	10.0	11.3	11.8	12.4	13.1
	-25	6.7	7.6	7.9	8.2	8.6	7.6	8.6	9.0	9.4	9.8	8.6	9.7	10.2	10.6	11.1	9.7	11.0	11.5	12.1	12.7
	-20	5.9	6.6	6.8	7.1	7.5	6.7	7.5	7.9	8.2	8.6	7.6	8.6	9.0	9.4	9.8	8.7	9.8	10.2	10.7	11.3
	-15	4.9	5.5	5.8	6.0	6.3	5.7	6.4	6.7	7.0	7.3	6.6	7.4	7.8	8.1	8.5	7.6	8.6	9.0	9.4	9.8
	-10	3.8	4.2	4.4	4.6	4.8	4.5	5.1	5.3	5.5	5.7	5.3	6.0	6.2	6.5	6.8	6.2	7.0	7.3	7.7	8.0
	-5	2.7	3.0	3.1	3.3	3.4	3.4	3.8	3.9	4.1	4.3	4.1	4.6	4.8	5.0	5.3	4.9	5.6	5.8	6.1	6.4
	0	1.8	2.0	2.1	2.2	2.3	2.5	2.8	2.9	3.0	3.1	3.2	3.5	3.7	3.9	4.0	3.9	4.4	4.6	4.8	5.1
	5	1.0	1.2	1.2	1.2	1.3	1.6	1.8	1.9	2.0	2.1	2.3	2.6	2.7	2.8	2.9	3.0	3.4	3.5	3.7	3.9
	10	.3	.4	.4	.4	.4	.9	1.0	1.0	1.1	1.1	1.5	1.7	1.8	1.8	1.9	2.2	2.5	2.6	2.7	2.8
11000	-35	6.6	7.4	7.8	8.1	8.5	7.5	8.5	8.8	9.2	9.7	8.5	9.6	10.0	10.5	11.0	9.6	10.9	11.4	11.9	12.5
	-30	6.4	7.2	7.5	7.8	8.2	7.3	8.2	8.6	8.9	9.4	8.3	9.3	9.7	10.2	10.7	9.3	10.6	11.1	11.6	12.2
	-25	6.0	6.7	7.0	7.3	7.6	6.9	7.7	8.0	8.4	8.8	7.8	8.8	9.2	9.6	10.1	8.9	10.0	10.5	11.0	11.5
	-20	5.3	5.9	6.1	6.4	6.7	6.1	6.8	7.1	7.4	7.8	7.0	7.9	8.2	8.6	9.0	8.0	9.0	9.4	9.9	10.3
	-15	4.4	4.9	5.1	5.3	5.5	5.2	5.8	6.0	6.3	6.6	6.0	6.8	7.0	7.4	7.7	6.9	7.8	8.2	8.5	9.0
	-10	3.2	3.6	3.8	3.9	4.1	4.0	4.4	4.6	4.8	5.0	4.7	5.3	5.5	5.8	6.1	5.6	6.3	6.6	6.9	7.2
	-5	2.2	2.5	2.6	2.7	2.8	2.9	3.2	3.4	3.5	3.7	3.6	4.1	4.2	4.4	4.6	4.4	5.0	5.2	5.4	5.7
	0	1.4	1.5	1.6	1.6	1.7	2.0	2.2	2.3	2.4	2.5	2.7	3.0	3.1	3.2	3.4	3.4	3.8	4.0	4.2	4.4
	5	.6	.7	.7	.7	.8	1.2	1.3	1.4	1.4	1.5	1.8	2.0	2.1	2.2	2.3	2.5	2.8	3.0	3.1	3.2
	10	-.1	-.1	-.1	-.1	-.1	.5	.5	.5	.6	.6	1.1	1.2	1.2	1.3	1.4	1.7	1.9	2.0	2.1	2.2

Figure 4-49 (Sheet 4)



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15<sup>0</sup>CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																													
		*12375						11500						11200						11000						10500					
		WIND KNOTS						WIND KNOTS						WIND KNOTS						WIND KNOTS						WIND KNOTS					
		-10	0	10	20	30		-10	0	10	20	30		-10	0	10	20	30		-10	0	10	20	30		-10	0	10	20	30	
1	-35	2.9	3.2	3.3	3.5	3.6		3.9	4.4	4.5	4.7	4.9		4.3	4.8	5.0	5.2	5.4		4.6	5.1	5.3	5.5	5.8		5.3	5.9	6.1	6.4	6.7	
2	-30	2.7	3.0	3.1	3.3	3.4		3.7	4.2	4.3	4.5	4.7		4.1	4.6	4.8	5.0	5.2		4.4	4.9	5.1	5.3	5.5		5.1	5.7	5.9	6.2	6.4	
0	-25	2.3	2.6	2.7	2.8	2.9		3.3	3.7	3.8	4.0	4.1		3.7	4.1	4.2	4.4	4.6		3.9	4.4	4.5	4.7	4.9		4.6	5.1	5.3	5.6	5.8	
0	-20	1.8	2.0	2.1	2.2	2.3		2.8	3.1	3.2	3.3	3.5		3.1	3.5	3.6	3.8	3.9		3.4	3.8	3.9	4.1	4.2		4.0	4.5	4.7	4.9	5.1	
0	-15	1.0	1.2	1.2	1.2	1.3		1.9	2.1	2.2	2.3	2.4		2.3	2.5	2.6	2.7	2.8		2.5	2.8	2.9	3.0	3.1		3.1	3.5	3.6	3.7	3.9	
0	-10	.2	.2	.2	.2	.2		1.0	1.1	1.1	1.2	1.2		1.3	1.4	1.5	1.5	1.6		1.5	1.7	1.7	1.8	1.9		2.1	2.3	2.4	2.5	2.6	
0	-5	-.6	-.7	-.7	-.7	-.8		.1	.2	.2	.2	.2		.4	.5	.5	.5	.5		.6	.7	.7	.7	.8		1.2	1.3	1.3	1.4	1.4	
0	0	-1.3	-1.4	-1.5	-1.5	-1.6		-.6	-.6	-.7	-.7	-.7		-.3	-.3	-.4	-.4	-.4		-.1	-.1	-.1	-.2	-.2		.4	.4	.4	.4	.5	
0	5	-1.9	-2.0	-2.1	-2.2	-2.3		-1.2	-1.3	-1.4	-1.4	-1.5		-.9	-1.0	-1.1	-1.1	-1.2		-.8	-.9	-.9	-.9	-1.0		-.3	-.3	-.4	-.4	-.4	
0	10	-2.4	-2.7	-2.7	-2.8	-2.9		-1.8	-2.0	-2.1	-2.1	-2.2		-1.6	-1.7	-1.8	-1.9	-1.9		-1.4	-1.5	-1.6	-1.7	-1.7		-1.0	-1.1	-1.1	-1.1	-1.2	
1	-35	2.5	2.7	2.8	2.9	3.0		3.4	3.8	4.0	4.1	4.3		3.8	4.2	4.4	4.6	4.8		4.1	4.5	4.7	4.9	5.1		4.8	5.3	5.5	5.7	6.0	
3	-30	2.3	2.5	2.6	2.7	2.8		3.2	3.6	3.7	3.9	4.0		3.6	4.0	4.2	4.3	4.5		3.9	4.3	4.5	4.6	4.8		4.6	5.1	5.3	5.5	5.7	
0	-25	1.9	2.1	2.1	2.2	2.3		2.8	3.1	3.2	3.3	3.5		3.2	3.5	3.6	3.8	3.9		3.4	3.8	3.9	4.1	4.3		4.1	4.5	4.7	4.9	5.1	
0	-20	1.4	1.5	1.6	1.7	1.7		2.3	2.6	2.6	2.7	2.9		2.7	2.9	3.0	3.2	3.3		2.9	3.2	3.3	3.5	3.6		3.5	3.9	4.1	4.2	4.4	
0	-15	.6	.7	.7	.7	.7		1.5	1.6	1.7	1.7	1.8		1.8	2.0	2.0	2.1	2.2		2.0	2.2	2.3	2.4	2.5		2.6	2.9	3.0	3.1	3.2	
0	-10	-.3	-.3	-.3	-.3	-.3		.5	.6	.6	.6	.7		.8	.9	.9	1.0	1.0		1.0	1.1	1.2	1.2	1.3		1.6	1.8	1.8	1.9	2.0	
0	-5	-1.0	-1.1	-1.2	-1.2	-1.3		-.3	-.3	-.3	-.4	-.4		.0	.0	.0	.0	.0		.2	.2	.2	.2	.2		.7	.8	.8	.8	.8	
0	0	-1.6	-1.8	-1.9	-1.9	-2.0		-1.0	-1.1	-1.1	-1.1	-1.2		-.7	-.8	-.8	-.8	-.9		-.5	-.6	-.6	-.6	-.7		-.1	-.1	-.1	-.1	-.1	
0	5	-2.2	-2.4	-2.5	-2.6	-2.7		-1.6	-1.7	-1.8	-1.8	-1.9		-1.3	-1.5	-1.5	-1.6	-1.6		-1.2	-1.3	-1.3	-1.4	-1.4		-.7	-.8	-.8	-.8	-.9	
0	10	-2.7	-3.0	-3.1	-3.2	-3.3		-2.1	-2.4	-2.4	-2.5	-2.6		-1.9	-2.1	-2.2	-2.3	-2.4		-1.8	-1.9	-2.0	-2.1	-2.2		-1.3	-1.5	-1.5	-1.6	-1.7	
1	-35	2.0	2.2	2.3	2.4	2.5		3.0	3.3	3.4	3.6	3.7		3.3	3.7	3.8	4.0	4.2		3.6	4.0	4.1	4.3	4.5		4.3	4.7	4.9	5.1	5.3	
4	-30	1.8	2.0	2.0	2.1	2.2		2.7	3.0	3.1	3.2	3.4		3.1	3.4	3.5	3.7	3.8		3.3	3.7	3.8	4.0	4.1		4.0	4.4	4.6	4.8	5.0	
0	-25	1.4	1.6	1.6	1.7	1.8		2.3	2.6	2.7	2.8	2.9		2.7	3.0	3.1	3.2	3.3		2.9	3.2	3.4	3.5	3.6		3.6	4.0	4.1	4.3	4.4	
0	-20	.9	1.0	1.1	1.1	1.1		1.8	2.0	2.1	2.1	2.2		2.1	2.3	2.4	2.5	2.6		2.4	2.6	2.7	2.8	2.9		3.0	3.3	3.4	3.5	3.7	
0	-15	.2	.2	.2	.2	.2		1.0	1.1	1.1	1.2	1.2		1.3	1.4	1.5	1.5	1.6		1.5	1.7	1.7	1.8	1.9		2.1	2.3	2.4	2.5	2.6	
0	-10	-.7	-.7	-.7	-.8	-.8		.1	.1	.1	.1	.1		.4	.4	.4	.5	.5		.6	.6	.7	.7	.7		1.1	1.2	1.3	1.3	1.4	
0	-5	-1.4	-1.5	-1.6	-1.6	-1.7		-.7	-.8	-.8	-.8	-.8		-.4	-.5	-.5	-.5	-.5		-.2	-.3	-.3	-.3	-.3		.3	.3	.3	.3	.3	
0	0	-2.0	-2.2	-2.3	-2.3	-2.4		-1.3	-1.5	-1.5	-1.6	-1.6		-1.1	-1.2	-1.2	-1.3	-1.3		-.9	-1.0	-1.0	-1.1	-1.1		-.5	-.5	-.5	-.5	-.6	
0	5	-2.5	-2.8	-2.9	-3.0	-3.1		-1.9	-2.1	-2.2	-2.3	-2.4		-1.7	-1.9	-1.9	-2.0	-2.1		-1.5	-1.7	-1.8	-1.8	-1.9		-1.1	-1.2	-1.3	-1.3	-1.4	
0	10	-3.0	-3.3	-3.4	-3.6	-3.7		-2.5	-2.7	-2.8	-2.9	-3.0		-2.3	-2.5	-2.6	-2.7	-2.7		-2.1	-2.3	-2.4	-2.5	-2.6		-1.7	-1.9	-1.9	-2.0	-2.1	

\*FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A HEIGHT IN EXCESS OF MAXIMUM  
DESIGN LANDING WEIGHT OF 11500 POUNDS

FAA-04-03

Figure 4-49 (Sheet 5)



## APPROACH GROSS CLIMB GRADIENT - PERCENT

FLAPS - 15°

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - UP  
AIRSPEED - VAPPSPEEDBRAKES - RETRACT  
INOPERATIVE ENGINE - WINDMILLING  
OPERATIVE ENGINE - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	6.1	6.8	7.1	7.4	7.7	6.9	7.6	8.1	8.5	8.9	7.9	8.9	9.3	9.7	10.2	9.0	10.1	10.6	11.1	11.6
2	-30	5.9	6.6	6.8	7.1	7.5	6.7	7.6	7.9	8.2	8.6	7.7	8.6	9.0	9.4	9.9	8.7	9.9	10.3	10.8	11.3
0	-25	5.4	6.0	6.2	6.5	6.8	6.2	6.9	7.2	7.6	7.9	7.1	8.0	8.3	8.7	9.1	8.1	9.2	9.6	10.0	10.5
0	-20	4.8	5.3	5.5	5.8	6.0	5.6	6.2	6.5	6.8	7.1	6.5	7.2	7.5	7.9	8.2	7.4	8.3	8.7	9.1	9.5
0	-15	3.8	4.2	4.4	4.6	4.8	4.5	5.1	5.3	5.5	5.8	5.4	6.0	6.3	6.6	6.9	6.3	7.1	7.4	7.7	8.1
0	-10	2.7	3.0	3.1	3.3	3.4	3.4	3.8	4.0	4.1	4.3	4.2	4.7	4.9	5.1	5.3	5.0	5.6	5.9	6.1	6.4
0	-5	1.7	1.9	2.0	2.1	2.2	2.4	2.7	2.8	2.9	3.0	3.1	3.5	3.6	3.8	3.9	3.9	4.3	4.5	4.7	4.9
0	0	.9	1.0	1.1	1.1	1.1	1.5	1.7	1.8	1.8	1.9	2.2	2.4	2.5	2.6	2.8	2.9	3.3	3.4	3.5	3.7
0	5	.2	.2	.2	.2	.3	.8	.9	.9	.9	1.0	1.4	1.6	1.6	1.7	1.8	2.1	2.3	2.4	2.5	2.6
0	10	-.5	-.5	-.6	-.6	-.6	.0	.0	.0	.1	.1	.6	.7	.7	.8	.8	1.3	1.4	1.5	1.5	1.6
1	-35	5.5	6.2	6.4	6.7	7.0	6.4	7.1	7.4	7.7	8.1	7.3	8.2	8.5	8.9	9.3	8.3	9.4	9.8	10.2	10.7
3	-30	5.3	5.9	6.2	6.4	6.7	6.1	6.9	7.1	7.4	7.8	7.1	7.9	8.2	8.6	9.0	8.1	9.1	9.5	9.9	10.4
0	-25	4.8	5.4	5.6	5.8	6.0	5.6	6.3	6.5	6.8	7.1	6.5	7.3	7.6	7.9	8.3	7.5	8.4	8.8	9.2	9.6
0	-20	4.2	4.7	4.9	5.1	5.3	5.0	5.6	5.8	6.1	6.3	5.9	6.6	6.8	7.1	7.5	6.8	7.7	8.0	8.3	8.7
0	-15	3.3	3.6	3.8	3.9	4.1	4.0	4.4	4.6	4.8	5.0	4.8	5.4	5.6	5.8	6.1	5.7	6.4	6.6	6.9	7.2
0	-10	2.2	2.4	2.5	2.6	2.7	2.9	3.2	3.3	3.5	3.6	3.6	4.0	4.2	4.4	4.6	4.4	5.0	5.2	5.4	5.6
0	-5	1.2	1.4	1.4	1.5	1.5	1.9	2.1	2.2	2.2	2.3	2.6	2.8	3.0	3.1	3.2	3.3	3.7	3.9	4.0	4.2
0	0	.5	.5	.5	.6	.6	1.0	1.2	1.2	1.3	1.3	1.7	1.9	2.0	2.0	2.1	2.4	2.7	2.8	2.9	3.0
0	5	-.2	-.2	-.3	-.3	-.3	.3	.4	.4	.4	.4	.9	1.0	1.1	1.1	1.2	1.6	1.8	1.8	1.9	2.0
0	10	-.9	-1.0	-1.0	-1.1	-1.1	-.4	-.4	-.4	-.5	-.5	.2	.2	.2	.2	.2	.8	.9	.9	1.0	1.0
1	-35	5.0	5.6	5.8	6.0	6.3	5.8	6.5	6.8	7.0	7.4	6.7	7.5	7.8	8.2	8.6	7.7	8.7	9.1	9.5	9.9
4	-30	4.7	5.2	5.4	5.7	5.9	5.5	6.1	6.4	6.6	6.9	6.4	7.1	7.4	7.8	8.1	7.4	8.3	8.6	9.0	9.4
0	-25	4.3	4.7	4.9	5.1	5.3	5.0	5.6	5.8	6.1	6.4	5.9	6.6	6.9	7.2	7.5	6.9	7.7	8.0	8.4	8.8
0	-20	3.6	4.0	4.2	4.4	4.5	4.4	4.9	5.1	5.3	5.5	5.2	5.8	6.1	6.3	6.6	6.1	6.9	7.2	7.5	7.8
0	-15	2.7	3.0	3.1	3.2	3.4	3.4	3.8	3.9	4.1	4.3	4.2	4.7	4.8	5.0	5.3	5.0	5.6	5.9	6.1	6.4
0	-10	1.7	1.9	2.0	2.0	2.1	2.3	2.6	2.7	2.8	2.9	3.1	3.4	3.5	3.7	3.8	3.9	4.3	4.5	4.7	4.9
0	-5	.8	.9	.9	.9	1.0	1.4	1.5	1.6	1.7	1.7	2.1	2.3	2.4	2.5	2.6	2.8	3.1	3.2	3.4	3.5
0	0	.0	.0	.1	.1	.1	.6	.7	.7	.7	.7	1.2	1.4	1.4	1.5	1.5	1.9	2.1	2.2	2.3	2.4
0	5	-.6	-.7	-.7	-.8	-.8	-.1	-.1	-.1	-.1	-.1	.5	.5	.5	.6	.6	1.1	1.2	1.3	1.3	1.4
0	10	-1.3	-1.4	-1.4	-1.5	-1.5	-.8	-.8	-.9	-.9	-.9	-.2	-.2	-.3	-.3	-.3	.4	.4	.4	.5	.5

22-01-00

Figure 4-49 (Sheet 6)



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		*12375					11500					11200					11000					10500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-25	16.9	19.3	20.3	21.4	22.5	19.2	22.1	23.2	24.5	25.9	20.1	23.1	24.4	25.7	27.2	20.7	23.9	25.1	26.6	28.2	22.4	25.9	27.3	28.9	30.7
	-20	17.0	19.3	20.3	21.4	22.5	19.3	22.1	23.2	24.5	25.9	20.1	23.2	24.4	25.7	27.2	20.8	23.9	25.2	26.6	28.1	22.4	25.9	27.3	28.9	30.6
	-15	17.0	19.4	20.3	21.4	22.5	19.3	22.1	23.3	24.5	25.9	20.2	23.2	24.4	25.7	27.2	20.8	23.9	25.2	26.6	28.1	22.5	25.9	27.3	28.9	30.6
	-10	17.1	19.4	20.4	21.4	22.5	19.4	22.2	23.3	24.5	25.9	20.3	23.2	24.4	25.7	27.2	20.9	24.0	25.2	26.6	28.1	22.5	26.0	27.4	28.9	30.6
	-5	17.1	19.4	20.4	21.4	22.5	19.4	22.2	23.3	24.5	25.9	20.3	23.3	24.4	25.8	27.2	20.9	24.0	25.2	26.6	28.1	22.6	26.0	27.4	28.9	30.6
	0	17.2	19.5	20.4	21.4	22.6	19.5	22.3	23.4	24.6	25.9	20.4	23.3	24.5	25.8	27.2	21.0	24.1	25.3	26.6	28.1	22.7	26.1	27.4	28.9	30.6
	5	17.2	19.5	20.5	21.5	22.6	19.6	22.3	23.4	24.6	25.9	20.4	23.4	24.5	25.8	27.2	21.1	24.1	25.3	26.7	28.2	22.7	26.1	27.5	29.0	30.6
	10	17.3	19.6	20.5	21.5	22.6	19.6	22.3	23.4	24.6	25.9	20.5	23.4	24.6	25.8	27.2	21.1	24.1	25.4	26.7	28.2	22.8	26.2	27.5	29.0	30.6
	15	17.3	19.6	20.5	21.5	22.6	19.7	22.4	23.5	24.6	26.0	20.6	23.4	24.6	25.9	27.3	21.2	24.2	25.4	26.7	28.2	22.9	26.2	27.5	29.0	30.6
	20	17.4	19.7	20.6	21.5	22.6	19.7	22.4	23.5	24.7	26.0	20.6	23.5	24.6	25.9	27.3	21.3	24.2	25.4	26.7	28.2	23.0	26.3	27.6	29.0	30.7
10	-25	16.8	19.0	19.8	20.8	21.8	19.1	21.7	22.7	23.8	25.1	20.0	22.7	23.8	25.0	26.4	20.6	23.5	24.6	25.9	27.2	22.3	25.4	26.7	28.1	29.7
	-20	16.8	19.0	19.8	20.8	21.8	19.1	21.7	22.7	23.8	25.1	20.0	22.7	23.8	25.0	26.4	20.6	23.5	24.6	25.9	27.2	22.3	25.4	26.7	28.1	29.7
	-15	16.8	19.1	20.0	21.0	22.1	19.1	21.8	22.9	24.1	25.5	20.0	22.9	24.0	25.3	26.7	20.6	23.6	24.8	26.2	27.6	22.4	26.2	27.4	28.5	29.7
	-10	16.8	19.1	20.0	21.0	22.1	19.2	21.9	22.9	24.1	25.5	20.0	22.9	24.1	25.3	26.7	20.6	23.6	24.8	26.2	27.7	22.3	25.6	27.0	28.4	30.1
	-5	16.9	19.2	20.1	21.1	22.2	19.2	21.9	23.0	24.2	25.5	20.1	23.0	24.1	25.4	26.8	20.7	23.7	24.9	26.2	27.7	22.4	25.7	27.0	28.5	30.1
	0	17.0	19.2	20.1	21.1	22.2	19.3	22.0	23.0	24.2	25.5	20.2	23.0	24.1	25.4	26.8	20.8	23.7	24.9	26.2	27.7	22.4	25.7	27.0	28.5	30.1
	5	17.0	19.3	20.2	21.1	22.2	19.3	22.0	23.1	24.2	25.5	20.2	23.1	24.2	25.4	26.8	20.9	23.8	25.0	26.3	27.7	22.5	25.8	27.1	28.5	30.2
	10	17.0	19.3	20.1	21.1	22.2	19.4	22.0	23.1	24.2	25.5	20.3	23.1	24.2	25.4	26.8	20.9	23.8	25.0	26.2	27.7	22.5	25.8	27.1	28.5	30.1
	15	16.8	19.0	19.9	20.8	21.9	19.1	21.7	22.8	23.9	25.1	20.0	22.8	23.9	25.1	26.4	20.6	23.5	24.6	25.9	27.3	22.3	25.5	26.7	28.1	29.7
	20	16.4	18.5	19.3	20.2	21.2	18.6	21.1	22.1	23.2	24.4	19.5	22.2	23.2	24.4	25.6	20.1	22.9	24.0	25.2	26.5	21.7	24.8	26.0	27.4	28.9
20	-25	15.5	17.5	18.3	19.1	20.0	17.7	20.0	21.0	22.0	23.1	18.5	21.0	22.0	23.1	24.3	19.1	21.7	22.8	23.9	25.1	20.7	23.6	24.7	26.0	27.4
	-20	14.1	15.9	16.6	17.4	18.2	16.2	18.3	19.2	20.1	21.1	17.0	19.3	20.2	21.1	22.2	17.6	19.9	20.9	21.9	23.0	19.1	21.7	22.7	23.9	25.1
	-15	12.7	14.3	14.9	15.5	16.3	14.6	16.5	17.3	18.1	19.0	15.4	17.4	18.2	19.1	20.1	15.9	18.0	18.9	19.8	20.8	17.3	19.7	20.6	21.6	22.8
	-10	11.1	12.5	13.0	13.6	14.2	13.0	14.6	15.3	16.0	16.8	13.7	15.4	16.1	16.9	17.7	14.1	16.0	16.7	17.5	18.4	15.5	17.5	18.4	19.3	20.3
	-5	9.5	10.7	11.2	11.7	12.2	11.3	12.7	13.3	13.9	14.5	11.9	13.5	14.1	14.7	15.4	12.4	14.0	14.6	15.3	16.1	13.6	15.4	16.1	16.9	17.8
	0	8.1	9.1	9.5	9.9	10.3	9.7	10.9	11.4	11.9	12.5	10.3	11.6	12.2	12.7	13.3	10.8	12.1	12.7	13.3	13.9	11.9	13.5	14.1	14.8	15.5
	5	7.3	8.2	8.5	8.9	9.3	8.9	10.0	10.4	10.9	11.4	9.5	10.7	11.1	11.6	12.2	9.9	11.1	11.6	12.2	12.8	11.0	12.4	13.0	13.6	14.3
	10	16.6	18.9	19.8	20.8	21.9	18.9	21.6	22.7	23.9	25.2	19.8	22.6	23.8	25.0	26.5	20.4	23.4	24.5	25.9	27.4	22.0	25.3	26.6	28.1	29.8
	15	16.6	18.9	19.8	20.8	21.9	18.9	21.6	22.7	23.9	25.2	19.8	22.6	23.8	25.0	26.4	20.4	23.4	24.6	25.9	27.3	22.0	25.3	26.7	28.1	29.8
	20	16.7	18.9	19.8	20.8	21.9	19.0	21.6	22.7	23.9	25.2	19.9	22.7	23.8	25.1	26.4	20.5	23.4	24.6	25.9	27.3	22.1	25.4	26.7	28.2	29.8
30	-25	16.7	19.0	19.9	20.8	21.9	19.0	21.7	22.7	23.9	25.2	19.9	22.7	23.8	25.1	26.5	20.5	23.5	24.6	25.9	27.4	22.2	25.4	26.7	28.2	29.8
	-20	16.7	19.0	19.9	20.8	21.9	19.0	21.7	22.7	23.9	25.2	19.9	22.7	23.8	25.1	26.5	20.5	23.5	24.6	25.9	27.4	22.2	25.4	26.7	28.2	29.8
	-15	16.8	19.0	19.9	20.8	21.9	19.1	21.7	22.8	23.9	25.2	20.0	22.8	23.9	25.1	26.5	20.6	23.5	24.7	25.9	27.4	22.3	25.5	26.8	28.2	29.8
	-10	16.8	19.0	19.9	20.9	21.9	19.1	21.7	22.8	23.9	25.2	20.0	22.8	23.9	25.1	26.5	20.6	23.5	24.7	25.9	27.4	22.3	25.5	26.8	28.2	29.8
	-5	16.8	19.0	19.9	20.9	21.9	19.1	21.7	22.8	23.9	25.2	20.0	22.8	23.9	25.1	26.5	20.6	23.5	24.7	26.0	27.4	22.3	25.5	26.8	28.2	29.8
	0	16.9	19.1	19.9	20.9	21.9	19.2	21.8	22.8	24.0	25.3	20.1	22.8	23.9	25.2	26.5	20.7	23.6	24.7	26.0	27.4	22.3	25.5	26.8	28.2	29.8
	5	16.9	19.1	20.0	20.9	22.0	19.2	21.8	22.9	24.0	25.3	20.1	22.9	24.0	25.2	26.5	20.7	23.6	24.8	26.0	27.4	22.4	25.6	26.9	28.3	29.8
	10	17.0	19.2	20.0	20.9	22.0	19.3	21.9	22.9	24.0	25.3	20.2	22.9	24.0	25.2	26.5	20.8	23.7	24.8	26.0	27.4	22.5	25.6	26.9	28.3	29.9
	15	16.4	18.4	19.3	20.1	21.1	18.6	21.1	22.1	23.1	24.3	19.5	22.1	23.2	24.3	25.6	20.1	22.8	23.9	25.1	26.4	21.7	24.8	26.0	27.3	28.8
	20	15.5	17.5	18.2	19.1	20.0	17.7	20.0	20.9	21.9	23.0	18.5	21.0	22.0	23.0	24.2	19.1	21.7	22.7	23.8	25.1	20.7	23.5	24.7	25.9	27.3
40	-25	14.4	16.2	16.9	17.6	18.5	16.5	18.6	19.5	20.4	21.4	17.3	19.5	20.4	21.4	22.5	17.8	20.2	21.1	22.2	23.3	19.3	22.0	23.0	24.2	25.4
	-20	13.2	14.8	15.4	16.1	16.9	15.2	17.1	17.9	18.7	19.7	15.9	18.0	18.8	19.7	20.7	16.5	18.6	19.5	20.4	21.5	17.9	20.3	21.3	22.3	23.5
	-15	11.7	13.1	13.7	14.3	14.9	13.6	15.3	16.0	16.7	17.5	14.3	16.1	16.9	17.7	18.5	14.8	16.7	17.5	18.3	19.2	16.2	18.3	19.2	20.1	21.1
	-10	10.1	11.4	11.8	12.4	12.9	11.9	13.4	14.0	14.6	15.3	12.6	14.2	14.8	15.5	16.3	13.1	14.7	15.4	16.1	16.9	14.3	16.2	16.9	17.8	18.7
	-5	8.6	9.7	10.1	10.5	11.0	10.3	11.6	12.1	12.6	13.2	10.9	12.3	12.8	13.4	14.1	11.3	12.8	13.4	14.0	14.7	12.5	14.2	14.8	15.5	16.3
	0	7.2	8.1	8.4	8.8	9.2	8.8	9.9	10.3	10.7	11.3	9.4	10.5	11.0	11.5	12.0	9.8	11.0	11.5	12.0	12.6	10.9	12.3	12.8	13.4	14.1
	5	16.7	19.0	19.9	20.8	21.9	19.0	21.7	22.7	23.9	25.2	19.8	22.7	23.9	25.1	26.5	20.5	23.4	24.6							



## LANDING GROSS CLIMB GRADIENT - PERCENT

## FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREF

SPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																									
		10000					9500					9000					8500					8000					
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	
0	-25	24.2	28.1	29.7	31.5	33.5	26.2	30.6	32.4	34.4	36.7	28.6	33.5	35.5	37.8	40.4	31.2	36.8	39.2	41.8	44.8	34.3	40.8	43.5	46.6	50.2	
	-20	24.3	28.1	29.7	31.5	33.4	26.3	30.6	32.4	34.4	36.7	28.6	33.5	35.5	37.8	40.4	31.3	36.9	39.2	41.8	44.8	34.4	40.8	43.5	46.6	50.1	
	-15	24.3	28.2	29.7	31.5	33.4	26.4	30.7	32.4	34.4	36.6	28.7	33.5	35.5	37.8	40.3	31.4	36.9	39.2	41.8	44.7	34.5	40.9	43.5	46.6	50.1	
	-10	24.4	28.2	29.8	31.5	33.4	26.5	30.7	32.5	34.4	36.6	28.8	33.6	35.6	37.8	40.3	31.5	37.0	39.2	41.8	44.7	34.6	40.9	43.6	46.6	50.1	
	-5	24.5	28.2	29.8	31.5	33.4	26.5	30.8	32.5	34.4	36.6	28.9	33.6	35.6	37.8	40.3	31.6	37.0	39.3	41.8	44.7	34.7	41.0	43.6	46.6	50.0	
	0	24.5	28.3	29.8	31.5	33.4	26.6	30.8	32.5	34.5	36.6	29.0	33.7	35.7	37.8	40.3	31.7	37.1	39.3	41.8	44.7	34.8	41.1	43.7	46.6	50.0	
	5	24.6	28.4	29.9	31.6	33.4	26.7	30.9	32.6	34.5	36.6	29.1	33.8	35.7	37.9	40.3	31.8	37.1	39.4	41.9	44.7	34.9	41.1	43.7	46.7	50.0	
	10	24.7	28.4	29.9	31.6	33.4	26.8	30.9	32.6	34.5	36.6	29.1	33.8	35.7	37.9	40.3	31.9	37.2	39.4	41.9	44.7	35.0	41.2	43.8	46.7	50.0	
	15	24.7	28.4	29.9	31.6	33.4	26.8	31.0	32.7	34.5	36.6	29.2	33.9	35.8	37.9	40.3	32.0	37.3	39.4	41.9	44.7	35.1	41.3	43.8	46.7	50.0	
	20	24.8	28.5	30.0	31.6	33.5	26.9	31.1	32.7	34.6	36.7	29.3	34.0	35.8	38.0	40.3	32.1	37.3	39.5	42.0	44.7	35.3	41.4	43.9	46.7	50.0	
1	25	24.1	27.6	29.0	30.6	32.4	26.1	30.1	31.7	33.5	35.5	28.5	32.9	34.7	36.8	39.0	31.2	36.2	38.3	40.6	43.3	34.3	40.1	42.5	45.3	48.4	
	30	22.1	25.3	26.6	28.0	29.6	24.0	27.6	29.1	30.7	32.4	26.2	30.2	31.9	33.7	35.7	28.7	33.3	35.2	37.3	39.6	31.6	36.9	39.1	41.5	44.3	
	35	20.1	23.0	24.2	25.4	26.8	21.9	25.2	26.5	27.9	29.5	24.0	27.6	29.1	30.7	32.6	26.3	30.4	32.1	34.0	36.1	29.0	33.8	35.7	37.9	40.4	
	40	18.1	20.7	21.7	22.8	24.1	19.8	22.7	23.8	25.1	26.5	21.7	25.0	26.3	27.7	29.3	23.9	27.6	29.1	30.7	32.6	26.4	30.6	32.4	34.3	36.5	
	45	16.1	18.4	19.3	20.3	21.4	17.7	20.3	21.3	22.4	23.6	19.5	22.3	23.5	24.8	26.2	21.5	24.8	26.1	27.6	29.2	23.8	27.6	29.1	30.8	32.8	
	50	14.2	16.2	17.0	17.8	18.8	15.7	17.9	18.8	19.8	20.9	17.3	19.9	20.9	22.0	23.3	19.2	22.1	23.3	24.6	26.0	21.3	24.7	26.0	27.6	29.3	
	55	12.5	14.2	14.9	15.7	16.5	13.9	15.8	16.6	17.5	18.4	15.4	17.6	18.5	19.5	20.6	17.1	19.7	20.7	21.9	23.1	19.1	22.1	23.3	24.6	26.1	
	0	-25	23.9	27.7	29.3	31.0	32.9	26.0	30.2	31.9	33.9	36.1	28.3	33.0	35.0	37.2	39.7	30.9	36.3	38.6	41.1	44.0	34.0	40.2	42.9	45.8	49.3
	-20	24.0	27.7	29.3	31.0	32.9	26.0	30.2	31.9	33.9	36.0	28.3	33.1	35.0	37.2	39.7	31.0	36.3	38.6	41.1	44.0	34.0	40.2	42.8	45.8	49.2	
	-15	24.1	27.8	29.3	31.0	32.9	26.1	30.3	32.0	33.9	36.0	28.4	33.1	35.0	37.2	39.7	31.1	36.4	38.6	41.1	44.0	34.2	40.3	42.9	45.8	49.2	
0	-10	24.1	27.8	29.3	31.0	32.9	26.2	30.3	32.0	33.9	36.0	28.5	33.2	35.1	37.2	39.7	31.2	36.5	38.7	41.1	43.9	34.3	40.4	42.9	45.8	49.2	
	-5	24.2	27.9	29.4	31.0	32.9	26.3	30.4	32.1	33.9	36.0	28.6	33.2	35.1	37.3	39.7	31.3	36.5	38.7	41.2	43.9	34.4	40.5	43.0	45.9	49.2	
	0	24.3	27.9	29.4	31.1	32.9	26.4	30.4	32.1	34.0	36.0	28.7	33.3	35.2	37.3	39.7	31.4	36.6	38.8	41.2	43.9	34.5	40.5	43.0	45.9	49.2	
	5	24.4	28.0	29.5	31.1	32.9	26.4	30.5	32.2	34.0	36.1	28.8	33.4	35.2	37.3	39.7	31.5	36.7	38.8	41.2	44.0	34.6	40.6	43.1	45.9	49.2	
	10	24.4	28.0	29.5	31.1	32.9	26.5	30.5	32.1	34.0	36.0	28.8	33.4	35.2	37.3	39.6	31.5	36.7	38.8	41.2	43.9	34.6	40.6	43.1	45.9	49.1	
	15	24.1	27.7	29.1	30.7	32.4	26.2	30.1	31.7	33.5	35.5	28.5	33.0	34.8	36.8	39.1	31.2	36.2	38.3	40.6	43.3	34.3	40.1	42.5	45.3	48.4	
	20	23.5	26.9	28.3	29.8	31.5	25.6	29.4	30.9	32.6	34.5	27.8	32.1	33.9	35.8	38.0	30.4	35.3	37.3	39.6	42.1	33.5	39.1	41.4	44.1	47.0	
	25	22.4	25.7	26.9	28.4	29.9	24.4	28.0	29.4	31.0	32.8	26.6	30.6	32.3	34.1	36.2	29.1	33.7	35.6	37.7	40.0	32.0	37.3	39.5	42.0	44.8	
	30	20.7	23.6	24.8	26.1	27.5	22.5	25.8	27.1	28.6	30.2	24.6	28.3	29.8	31.5	33.3	27.0	31.2	32.9	34.8	36.9	29.7	34.6	36.5	38.8	41.3	
	35	18.9	21.5	22.6	23.7	25.0	20.6	23.6	24.8	26.1	27.5	22.5	25.9	27.2	28.7	30.4	24.7	28.6	30.1	31.8	33.7	27.3	31.7	33.5	35.5	37.8	
2	40	16.9	19.2	20.2	21.2	22.3	18.5	21.2	22.2	23.4	24.6	20.3	23.3	24.5	25.8	27.3	22.4	25.8	27.1	28.7	30.4	24.7	28.7	30.2	32.0	34.0	
	45	15.0	17.0	17.8	18.7	19.7	16.5	18.8	19.7	20.7	21.8	18.1	20.8	21.8	23.0	24.3	20.0	23.0	24.2	25.6	27.1	22.2	25.7	27.1	28.7	30.4	
	50	13.2	14.9	15.6	16.4	17.3	14.6	16.6	17.4	18.3	19.2	16.1	18.4	19.3	20.4	21.5	17.9	20.5	21.6	22.8	24.1	19.9	23.0	24.2	25.6	27.1	
	52	12.2	13.8	14.5	15.2	16.0	13.5	15.4	16.1	17.0	17.9	15.0	17.2	18.0	19.0	20.0	16.7	19.2	20.2	21.3	22.5	18.7	21.5	22.7	24.0	25.4	
	0	-25	23.8	27.5	29.0	30.7	32.5	25.8	30.0	31.7	33.6	35.7	28.1	32.8	34.7	36.9	39.3	30.7	36.0	38.2	40.7	43.5	33.8	39.9	42.4	45.3	48.7
	-20	23.9	27.5	29.0	30.7	32.5	25.9	30.0	31.7	33.5	35.6	28.2	32.8	34.7	36.8	39.2	30.8	36.1	38.2	40.7	43.5	33.9	39.9	42.4	45.3	48.6	
	-15	23.9	27.6	29.0	30.7	32.5	26.0	30.1	31.7	33.6	35.6	28.3	32.9	34.8	36.9	39.2	30.9	36.1	38.3	40.7	43.4	34.0	40.0	42.5	45.3	48.6	
	-10	24.0	27.6	29.1	30.7	32.5	26.1	30.1	31.8	33.6	35.6	28.4	32.9	34.8	36.9	39.2	31.0	36.2	38.3	40.7	43.4	34.1	40.1	42.5	45.4	48.6	
	-5	24.1	27.7	29.1	30.7	32.5	26.1	30.2	31.8	33.6	35.7	28.5	33.0	34.8	36.9	39.2	31.1	36.3	38.4	40.7	43.4	34.2	40.1	42.6	45.4	48.6	
	0	24.2	27.7	29.2	30.8	32.6	26.2	30.2	31.8	33.6	35.7	28.6	33.1	34.9	36.9	39.3	31.2	36.3	38.4	40.8	43.5	34.3	40.2	42.7	45.4	48.6	
0	5	24.3	27.8	29.2	30.8	32.6	26.3	30.3	31.9	33.7	35.7	28.7	33.1	35.0	37.0	39.3	31.3	36.4	38.5	40.8	43.5	34.4	40.3	42.7	45.5	48.6	
	10	24.3	27.9	29.3	30.8	32.6	26.4	30.3	31.9	33.7	35.7	28.7	33.2	35.0	37.0	39.3	31.4	36.5	38.5	40.9	43.5	34.5	40.4	42.8	45.5	48.6	
	15	23.5	26.9	28.3	29.8	31.4	25.6	29.3	30.9	32.5	34.4	27.8	32.1	33.8	35.7	37.9	30.4	35.3	37.2	39.4	41.9	33.5	39.0	41.3	43.9	46.9	
	20	22.4	25.6	26.9	28.3	29.9	24.4	27.9	29.4	31.0	32.7	26.6	30.6	32.2	34.0	36.0	29.1	33.6	35.5	37.6	39.9	32.0	37.2	39.4	41.8	44.6	
	25	21.0	23.9	25.1	26.4	27.8	22.9	26.2	27.5	28.9	30.6	24.9	28.7	30.2	31.8	33.7	27.3	31.5	33.2	35.2	37						



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																									
		*12375					11500					11200					11000					10500					
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	
4000	-35	16.8	19.0	19.9	20.9	22.0	19.1	21.7	22.8	24.0	25.2	19.9	22.8	23.9	25.1	26.5	20.6	23.5	24.7	26.0	27.4	22.2	25.5	26.8	28.2	29.8	
	-30	16.8	19.0	19.9	20.9	21.9	19.1	21.7	22.8	23.9	25.2	20.0	22.8	23.9	25.1	26.5	20.6	23.5	24.7	25.9	27.4	22.2	25.5	26.8	28.2	29.8	
	-20	16.8	19.0	19.9	20.9	21.9	19.1	21.8	22.8	23.9	25.2	20.0	22.8	23.9	25.1	26.5	20.6	23.5	24.7	25.9	27.4	22.3	25.5	26.8	28.2	29.8	
	-15	16.9	19.1	19.9	20.9	21.9	19.2	21.8	22.8	23.9	25.2	20.1	22.8	23.9	25.1	26.5	20.7	23.6	24.7	25.9	27.3	22.3	25.5	26.8	28.2	29.8	
	-10	16.9	19.1	20.0	20.9	21.9	19.2	21.8	22.8	24.0	25.2	20.1	22.9	23.9	25.1	26.5	20.7	23.6	24.7	26.0	27.3	22.4	25.6	26.8	28.2	29.8	
	-5	17.0	19.1	20.0	20.9	21.9	19.3	21.9	22.9	24.0	25.2	20.2	22.9	24.0	25.2	26.5	20.8	23.6	24.8	26.0	27.4	22.5	25.6	26.9	28.2	29.8	
	0	16.9	19.0	19.9	20.8	21.8	19.2	21.7	22.7	23.8	25.0	20.1	22.8	23.8	25.0	26.3	20.7	23.5	24.6	25.8	27.2	22.4	25.5	26.7	28.1	29.6	
	5	16.2	18.2	19.0	19.9	20.8	18.5	20.9	21.8	22.9	24.0	19.3	21.9	22.9	24.0	25.2	19.9	22.6	23.6	24.8	26.1	21.6	24.5	25.7	27.0	28.0	
	10	15.2	17.1	17.8	18.6	19.5	17.4	19.6	20.5	21.5	22.5	18.2	20.6	21.5	22.6	23.7	18.8	21.3	22.3	23.3	24.5	20.4	23.1	24.2	25.4	26.7	
	15	14.3	16.0	16.7	17.5	18.3	16.4	18.5	19.3	20.2	21.2	17.2	19.4	20.3	21.2	22.3	17.7	20.1	21.0	22.0	23.1	19.2	21.8	22.8	24.0	25.2	
3000	-20	13.4	15.0	15.7	16.3	17.1	15.4	17.4	18.1	19.0	19.9	16.2	18.3	19.1	20.0	20.9	16.7	18.9	19.7	20.7	21.7	18.2	20.6	21.5	22.6	23.7	
	-15	12.5	14.0	14.6	15.3	15.9	14.5	16.3	17.0	17.8	18.6	15.2	17.2	17.9	18.7	19.6	15.7	17.8	18.5	19.4	20.4	17.1	19.4	20.3	21.2	22.3	
	-10	11.3	12.6	13.1	13.7	14.3	13.1	14.8	15.4	16.1	16.8	13.8	15.6	16.3	17.0	17.8	14.3	16.1	16.9	17.6	18.5	15.7	17.7	18.5	19.3	20.3	
	-5	9.8	10.9	11.4	11.8	12.4	11.5	12.9	13.5	14.1	14.7	12.2	13.7	14.3	14.9	15.6	12.6	14.2	14.8	15.5	16.2	13.9	15.6	16.3	17.1	17.9	
	0	8.3	9.2	9.6	10.0	10.4	9.9	11.1	11.6	12.1	12.6	10.5	11.8	12.3	12.8	13.4	10.9	12.3	12.8	13.4	14.0	12.1	13.6	14.2	14.9	15.6	
	5	6.9	7.7	8.0	8.3	8.7	8.4	9.4	9.8	10.3	10.7	9.0	10.1	10.5	11.0	11.5	9.4	10.6	11.0	11.5	12.0	10.5	11.8	12.3	12.9	13.5	
	10	6.5	7.3	7.6	7.9	8.2	8.0	9.0	9.3	9.8	10.2	8.6	9.6	10.0	10.5	10.9	9.0	10.1	10.5	11.0	11.5	10.0	11.3	11.8	12.3	12.9	
	5000	-35	16.9	19.1	20.0	21.0	22.0	19.2	21.8	22.9	24.0	25.3	20.1	22.9	24.0	25.2	26.6	20.7	23.6	24.8	26.1	27.5	22.3	25.6	26.9	28.3	29.9
		-30	16.9	19.1	20.0	20.9	22.0	19.2	21.8	22.9	24.0	25.3	20.1	22.9	24.0	25.2	26.5	20.7	23.6	24.7	26.0	27.4	22.3	25.6	26.8	28.3	29.9
		-25	16.9	19.1	20.0	20.9	22.0	19.2	21.8	22.9	24.0	25.2	20.1	22.9	24.0	25.2	26.5	20.7	23.6	24.7	26.0	27.4	22.4	25.6	26.8	28.2	29.8
-20		16.9	19.1	20.0	20.9	22.0	19.3	21.8	22.9	24.0	25.2	20.1	22.9	24.0	25.2	26.5	20.8	23.6	24.8	26.0	27.4	22.4	25.6	26.8	28.2	29.8	
-15		17.0	19.1	20.0	20.9	21.9	19.3	21.9	22.9	24.0	25.2	20.2	22.9	24.0	25.2	26.5	20.8	23.6	24.8	26.0	27.4	22.5	25.6	26.9	28.2	29.8	
-10		16.8	18.9	19.7	20.6	21.6	19.1	21.6	22.5	23.6	24.8	19.9	22.6	23.6	24.8	26.1	20.5	23.3	24.4	25.6	26.9	22.2	25.3	26.5	27.8	29.3	
-5		16.5	18.6	19.4	20.3	21.2	18.8	21.2	22.2	23.3	24.4	19.7	22.3	23.3	24.4	25.7	20.3	23.0	24.0	25.2	26.5	21.9	24.9	26.1	27.4	28.9	
0		16.0	18.0	18.8	19.6	20.6	18.3	20.6	21.5	22.6	23.7	19.1	21.6	22.6	23.7	24.9	19.7	22.3	23.3	24.5	25.7	21.3	24.2	25.4	26.6	28.0	
5		15.1	17.0	17.7	18.5	19.3	17.3	19.5	20.3	21.3	22.3	18.1	20.4	21.4	22.4	23.5	18.7	21.1	22.1	23.1	24.3	20.2	22.9	24.0	25.2	26.5	
10		14.2	15.9	16.6	17.3	18.1	16.3	18.3	19.1	20.0	21.0	17.1	19.2	20.1	21.0	22.1	17.6	19.9	20.8	21.8	22.8	19.1	21.6	22.6	23.7	24.9	
6000	-15	13.3	14.9	15.5	16.2	16.9	15.3	17.2	17.9	18.8	19.7	16.1	18.1	18.9	19.8	20.7	16.6	18.7	19.6	20.5	21.5	18.0	20.4	21.3	22.3	23.5	
	-10	12.5	14.0	14.6	15.2	15.9	14.5	16.3	17.0	17.7	18.6	15.2	17.1	17.9	18.7	19.6	15.7	17.7	18.5	19.4	20.3	17.1	19.4	20.2	21.2	22.2	
	-5	11.8	13.2	13.7	14.3	14.9	13.7	15.3	16.0	16.7	17.5	14.4	16.2	16.9	17.6	18.5	14.9	16.8	17.5	18.3	19.2	16.2	18.3	19.1	20.0	21.1	
	0	10.3	11.5	12.0	12.5	13.0	12.1	13.6	14.1	14.7	15.4	12.8	14.3	14.9	15.6	16.3	13.2	14.9	15.5	16.2	17.0	14.5	16.3	17.1	17.8	18.7	
	5	8.8	9.8	10.2	10.7	11.1	10.5	11.8	12.2	12.8	13.3	11.1	12.5	13.0	13.6	14.2	11.6	13.0	13.5	14.1	14.8	12.8	14.3	15.0	15.7	16.4	
	10	7.4	8.2	8.6	8.9	9.3	9.0	10.0	10.4	10.9	11.4	9.6	10.7	11.1	11.6	12.2	10.0	11.2	11.6	12.2	12.7	11.1	12.4	13.0	13.6	14.2	
	15	6.3	7.0	7.2	7.5	7.9	7.7	8.6	9.0	9.4	9.8	8.3	9.3	9.7	10.1	10.5	8.7	9.7	10.1	10.6	11.1	9.7	10.9	11.4	11.9	12.5	
	7000	-35	17.0	19.2	20.1	21.0	22.1	19.3	21.9	23.0	24.1	25.4	20.2	23.0	24.1	25.3	26.6	20.8	23.7	24.9	26.1	27.5	22.5	25.7	27.0	28.4	29.9
		-30	17.0	19.2	20.1	21.0	22.0	19.3	21.9	22.9	24.1	25.3	20.2	23.0	24.0	25.2	26.6	20.8	23.7	24.8	26.1	27.5	22.5	25.6	26.9	28.3	29.9
		-25	17.0	19.2	20.1	21.0	22.0	19.4	21.9	22.9	24.1	25.3	20.2	23.0	24.0	25.2	26.5	20.9	23.7	24.8	26.1	27.4	22.5	25.7	26.9	28.3	29.8
-20		17.1	19.2	20.1	21.0	22.0	19.4	21.9	22.9	24.1	25.3	20.3	23.0	24.1	25.2	26.5	20.9	23.7	24.8	26.1	27.4	22.6	25.7	26.9	28.3	29.8	
-15		17.0	19.1	19.9	20.8	21.8	19.3	21.8	22.8	23.9	25.1	20.2	22.8	23.9	25.0	26.3	20.8	23.6	24.7	25.9	27.2	22.4	25.5	26.7	28.1	29.6	
-10		16.7	18.7	19.5	20.4	21.4	19.0	21.4	22.4	23.4	24.6	19.8	22.4	23.4	24.6	25.8	20.4	23.1	24.2	25.4	26.7	22.1	25.1	26.3	27.6	29.0	
-5		16.1	18.0	18.8	19.7	20.6	18.3	20.7	21.6	22.6	23.7	19.2	21.7	22.6	23.7	24.9	19.8	22.4	23.4	24.5	25.7	21.4	24.2	25.4	26.6	28.0	
0		15.0	16.9	17.6	18.3	19.2	17.2	19.4	20.2	21.1	22.2	18.0	20.3	21.2	22.2	23.3	18.6	21.0	21.9	23.0	24.1	20.1	22.8	23.9	25.0	26.3	
5		14.1	15.8	16.4	17.1	17.9	16.2	18.2	19.0	19.8	20.8	16.9	19.1	19.9	20.8	21.9	17.5	19.7	20.6	21.6	22.6	19.0	21.5	22.5	23.5	24.7	
10		13.2	14.7	15.3	16.0	16.7	15.2	17.0	17.8	18.6	19.4	15.9	17.9	18.7	19.6	20.5	16.5	18.6	19.4	20.3	21.2	17.9	20.2	21.1	22.1	23.2	
8000	-15	12.3	13.8	14.4	15.0	15.6	14.3	16.0	16.7	17.4	18.2	15.0	16.9	17.6	18.4	19.3	15.5	17.5	18.2	19.1	20.0	16					



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
4	-30	24.0	27.7	29.1	30.8	32.6	26.1	30.1	31.8	33.6	35.7	28.4	33.0	34.8	36.9	39.3	31.0	36.2	38.4	40.8	43.5
0	-25	24.1	27.7	29.1	30.7	32.5	26.1	30.1	31.8	33.6	35.6	28.4	33.0	34.8	36.9	39.2	31.1	36.2	38.3	40.7	43.4
0	-20	24.1	27.7	29.1	30.7	32.5	26.2	30.2	31.8	33.6	35.6	28.5	33.0	34.8	36.9	39.2	31.1	36.2	38.3	40.7	43.4
0	-15	24.2	27.7	29.1	30.7	32.5	26.2	30.2	31.8	33.6	35.6	28.6	33.0	34.8	36.9	39.1	31.2	36.3	38.4	40.7	43.3
0	-10	24.2	27.8	29.2	30.7	32.5	26.3	30.2	31.8	33.6	35.6	28.6	33.1	34.9	36.9	39.1	31.3	36.3	38.4	40.7	43.3
0	-5	24.3	27.8	29.2	30.8	32.5	26.4	30.3	31.9	33.6	35.6	28.7	33.1	34.9	36.9	39.1	31.4	36.4	38.4	40.7	43.3
0	0	24.2	27.7	29.0	30.6	32.3	26.3	30.1	31.7	33.4	35.3	28.6	33.0	34.7	36.7	38.9	31.3	36.2	38.2	40.5	43.0
0	5	23.3	26.6	27.9	29.4	31.0	25.4	29.0	30.5	32.1	34.0	27.6	31.8	33.4	35.3	37.4	30.2	34.9	36.8	38.9	41.3
0	10	22.1	25.2	26.4	27.7	29.2	24.0	27.4	28.8	30.3	32.0	26.2	30.1	31.6	33.3	35.3	28.6	33.0	34.8	36.8	39.0
0	15	20.9	23.8	24.9	26.2	27.6	22.8	26.0	27.3	28.7	30.3	24.8	28.5	29.9	31.5	33.3	27.2	31.3	33.0	34.8	36.9
0	20	19.8	22.5	23.5	24.7	26.0	21.6	24.6	25.8	27.1	28.6	23.6	27.0	28.3	29.8	31.5	25.8	29.7	31.2	33.0	34.9
0	25	18.7	21.2	22.2	23.3	24.5	20.4	23.2	24.3	25.6	26.9	22.3	25.5	26.8	28.2	29.7	24.5	28.1	29.6	31.2	33.0
0	30	17.1	19.4	20.3	21.3	22.3	18.7	21.3	22.3	23.4	24.7	20.5	23.4	24.6	25.9	27.3	22.6	25.9	27.2	28.7	30.3
0	35	15.2	17.2	18.0	18.9	19.8	16.7	19.0	19.9	20.9	22.0	18.4	21.0	22.0	23.1	24.4	20.3	23.3	24.4	25.7	27.2
0	40	13.4	15.1	15.8	16.5	17.4	14.8	16.7	17.5	18.4	19.3	16.4	18.6	19.5	20.5	21.6	18.1	20.7	21.7	22.9	24.1
0	45	11.7	13.2	13.8	14.4	15.1	13.0	14.7	15.4	16.1	16.9	14.5	16.4	17.2	18.1	19.0	16.1	18.4	19.3	20.3	21.4
0	46	11.2	12.6	13.2	13.8	14.5	12.5	14.1	14.8	15.5	16.3	13.9	15.8	16.6	17.4	18.3	15.6	17.7	18.6	19.5	20.6
5	-35	24.2	27.8	29.2	30.9	32.7	26.2	30.3	31.9	33.7	35.8	28.5	33.1	34.9	37.0	39.4	31.2	36.3	38.5	40.9	43.6
5	-30	24.2	27.8	29.2	30.8	32.6	26.2	30.2	31.9	33.7	35.7	28.5	33.1	34.9	37.0	39.3	31.2	36.3	38.4	40.8	43.5
5	-25	24.2	27.8	29.2	30.8	32.5	26.3	30.2	31.9	33.6	35.6	28.6	33.1	34.9	36.9	39.2	31.2	36.3	38.4	40.7	43.4
5	-20	24.3	27.8	29.2	30.8	32.5	26.3	30.3	31.9	33.6	35.6	28.7	33.1	34.9	36.9	39.2	31.3	36.4	38.4	40.7	43.3
5	-15	24.3	27.8	29.2	30.8	32.5	26.4	30.3	31.9	33.6	35.6	28.7	33.1	34.9	36.9	39.1	31.4	36.4	38.4	40.7	43.3
5	-10	24.0	27.4	28.8	30.3	32.0	26.1	29.9	31.4	33.1	35.0	28.4	32.7	34.4	36.4	38.5	31.0	35.9	37.9	40.1	42.6
5	-5	23.7	27.1	28.4	29.9	31.5	25.7	29.5	31.0	32.7	34.5	28.0	32.2	33.9	35.8	38.0	30.6	35.4	37.4	39.5	42.0
5	0	23.1	26.3	27.6	29.0	30.6	25.1	28.7	30.1	31.7	33.5	27.3	31.4	33.0	34.8	36.9	29.9	34.5	36.4	38.4	40.8
5	5	22.0	25.0	26.2	27.5	29.0	23.9	27.3	28.6	30.1	31.8	26.0	29.9	31.4	33.1	35.0	28.5	32.8	34.6	36.5	38.7
5	10	20.8	23.6	24.7	25.9	27.3	22.6	25.8	27.0	28.4	30.0	24.7	28.2	29.7	31.3	33.0	27.0	31.1	32.7	34.5	36.6
5	15	19.6	22.3	23.3	24.5	25.7	21.4	24.4	25.5	26.8	28.3	23.4	26.7	28.1	29.5	31.2	25.6	29.4	31.0	32.7	34.6
5	20	18.7	21.2	22.1	23.2	24.4	20.4	23.2	24.3	25.5	26.9	22.3	25.5	26.7	28.1	29.6	24.5	28.1	29.5	31.1	32.9
5	25	17.7	20.1	21.0	22.0	23.1	19.4	22.0	23.0	24.2	25.5	21.2	24.2	25.4	26.7	28.1	23.3	26.7	28.1	29.6	31.2
5	30	15.9	18.0	18.8	19.7	20.6	17.4	19.8	20.7	21.7	22.8	19.2	21.8	22.9	24.0	25.3	21.1	24.1	25.3	26.7	28.2
5	35	14.1	15.9	16.6	17.3	18.2	15.5	17.5	18.4	19.2	20.2	17.1	19.4	20.4	21.4	22.5	18.9	21.6	22.7	23.8	25.1
5	40	12.3	13.8	14.5	15.1	15.9	13.6	15.4	16.1	16.9	17.7	15.1	17.2	18.0	18.9	19.8	16.8	19.2	20.1	21.1	22.3
5	44	10.9	12.2	12.8	13.4	14.0	12.1	13.7	14.3	15.0	15.8	13.6	15.4	16.1	16.9	17.7	15.2	17.2	18.1	19.0	20.0
6	-35	24.3	27.9	29.3	30.9	32.7	26.4	30.3	32.0	33.8	35.8	28.7	33.2	35.0	37.1	39.4	31.3	36.4	38.5	40.9	43.5
6	-30	24.3	27.8	29.3	30.8	32.6	26.4	30.3	31.9	33.7	35.7	28.7	33.1	34.9	37.0	39.2	31.3	36.4	38.5	40.8	43.4
6	-25	24.4	27.9	29.3	30.8	32.6	26.4	30.3	31.9	33.7	35.6	28.7	33.2	35.0	37.0	39.2	31.4	36.4	38.5	40.8	43.3
6	-20	24.4	27.9	29.3	30.8	32.5	26.5	30.4	31.9	33.7	35.6	28.8	33.2	35.0	36.9	39.1	31.5	36.4	38.5	40.7	43.3
6	-15	24.3	27.7	29.1	30.6	32.3	26.3	30.2	31.7	33.4	35.3	28.7	33.0	34.7	36.7	38.8	31.3	36.2	38.2	40.4	42.9
6	-10	23.9	27.2	28.6	30.0	31.7	25.9	29.7	31.2	32.8	34.7	28.2	32.4	34.1	36.0	38.1	30.8	35.6	37.6	39.7	42.1
6	-5	23.2	26.3	27.6	29.0	30.6	25.1	28.7	30.1	31.7	33.5	27.4	31.4	33.0	34.8	36.8	29.9	34.5	36.4	38.4	40.7
6	0	21.8	24.8	26.0	27.3	28.7	23.8	27.1	28.4	29.9	31.5	25.9	29.7	31.2	32.8	34.7	28.3	32.6	34.3	36.3	38.4
6	5	20.6	23.4	24.5	25.7	27.0	22.5	25.6	26.8	28.2	29.7	24.5	28.0	29.4	31.0	32.7	26.9	30.8	32.5	34.2	36.2
6	10	19.5	22.1	23.1	24.2	25.5	21.2	24.2	25.3	26.6	28.0	23.2	26.5	27.8	29.3	30.9	25.5	29.2	30.7	32.4	34.2
6	15	18.4	20.9	21.8	22.9	24.0	20.1	22.9	23.9	25.1	26.4	22.0	25.1	26.3	27.7	29.2	24.2	27.7	29.1	30.6	32.4
6	20	17.5	19.8	20.7	21.6	22.7	19.1	21.7	22.7	23.8	25.0	21.0	23.9	25.0	26.3	27.7	23.0	26.3	27.6	29.1	30.7
6	25	16.2	18.3	19.2	20.1	21.0	17.8	20.2	21.1	22.1	23.2	19.6	22.2	23.3	24.5	25.8	21.5	24.6	25.8	27.1	28.6
6	30	14.6	16.4	17.1	17.9	18.8	16.0	18.1	18.9	19.8	20.8	17.7	20.0	21.0	22.0	23.2	19.5	22.2	23.3	24.5	25.8
6	35	12.9	14.5	15.1	15.8	16.6	14.2	16.1	16.8	17.6	18.5	15.8	17.9	18.7	19.6	20.6	17.5	19.9	20.9	21.9	23.1
6	40	11.2	12.6	13.2	13.8	14.4	12.5	14.1	14.8	15.4	16.2	14.0	15.8	16.5	17.3	18.2	15.6	17.7	18.5	19.5	20.5
6	42	10.5	11.8	12.3	12.9	13.5	11.8	13.3	13.9	14.5	15.2	13.2	14.9	15.6	16.3	17.1	14.7	16.7	17.5	18.4	19.4
7	-35	24.4	27.9	29.4	30.9	32.7	26.5	30.4	32.0	33.8	35.8	28.8	33.3	35.1	37.1	39.3	31.5	36.5	38.6	40.9	43.5
7	-30	24.4	27.9	29.2	30.8	32.5	26.4	30.3	31.9	33.6	35.6	28.8	33.2	34.9	36.9	39.1	31.4	36.4	38.4	40.7	43.3
7	-25	24.3	27.7	29.1	30.6	32.3	26.3	30.2	31.7	33.4	35.3	28.6	33.0	34.7	36.6	38.8	31.3	36.2	38.2	40.4	42.9
7	-20	24.2	27.5	28.9	30.4	32.0	26.2	30.0	31.5	33.2	35.0	28.5	32.8	34.5	36.4	38.5	31.1	36.0	37.9	40.1	42.6
7	-15	23.6	26.9	28.2	29.6	31.2	25.6	29.3	30.7	32.3	34.1	27.9	32.0	33.6	35.5	37.5	30.5	35.1	37.0	39.1	41.5
7	-10	22.9	26.1	27.3	28.7	30.2	24.9	28.4	29.8	31.3	33.1	27.1	31.1	32.7	34.4	36.4	29.6	34.1	35.9	37.9	



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		*12375					11500					11200					11000					10500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8000	-35	17.0	19.2	20.0	20.9	21.9	19.4	21.9	22.9	24.0	25.2	20.3	23.0	24.0	25.2	26.5	20.9	23.7	24.8	26.0	27.4	22.6	25.7	26.9	28.3	29.8
	-30	17.0	19.1	19.9	20.8	21.8	19.3	21.8	22.8	23.9	25.1	20.2	22.9	23.9	25.1	26.3	20.9	23.6	24.7	25.9	27.2	22.5	25.6	26.8	28.1	29.6
	-25	16.9	19.0	19.8	20.7	21.7	19.3	21.7	22.7	23.8	24.9	20.2	22.8	23.8	24.9	26.2	20.8	23.5	24.6	25.8	27.1	22.4	25.5	26.7	28.0	29.4
	-20	16.7	18.8	19.6	20.4	21.4	19.1	21.5	22.4	23.4	24.6	19.9	22.5	23.5	24.6	25.8	20.5	23.2	24.3	25.4	26.7	22.2	25.2	26.3	27.6	29.0
	-15	15.8	17.7	18.5	19.3	20.2	18.1	20.3	21.2	22.2	23.2	18.9	21.3	22.3	23.3	24.4	19.5	22.0	23.0	24.1	25.3	21.1	23.9	25.0	26.2	27.5
	-10	14.9	16.7	17.4	18.1	18.9	17.1	19.2	20.0	20.9	21.9	17.9	20.1	21.0	22.0	23.0	18.5	20.8	21.7	22.7	23.8	20.0	22.6	23.6	24.7	26.0
	-5	13.9	15.5	16.2	16.8	17.6	16.0	17.9	18.7	19.5	20.4	16.8	18.8	19.7	20.5	21.5	17.3	19.5	20.3	21.3	22.3	18.8	21.2	22.1	23.2	24.3
	0	12.9	14.4	15.0	15.6	16.3	14.9	16.8	17.5	18.2	19.1	15.7	17.6	18.4	19.2	20.1	16.2	18.2	19.0	19.9	20.8	17.6	19.9	20.8	21.7	22.8
	5	12.1	13.5	14.0	14.6	15.2	14.0	15.7	16.3	17.0	17.8	14.7	16.5	17.2	18.0	18.8	15.2	17.1	17.8	18.6	19.5	16.6	18.7	19.5	20.4	21.4
	10	11.2	12.5	13.0	13.5	14.1	13.1	14.7	15.3	15.9	16.6	13.8	15.5	16.1	16.8	17.6	14.3	16.0	16.7	17.4	18.2	15.6	17.5	18.3	19.1	20.0
9000	-35	10.5	11.6	12.1	12.6	13.1	12.3	13.7	14.3	14.9	15.5	13.0	14.5	15.1	15.7	16.5	13.4	15.0	15.7	16.3	17.1	14.7	16.5	17.2	18.0	18.8
	-30	9.6	10.7	11.1	11.6	12.1	11.4	12.7	13.2	13.8	14.4	12.0	13.5	14.0	14.6	15.3	12.5	14.0	14.6	15.2	15.9	13.7	15.4	16.0	16.7	17.5
	-25	8.5	9.5	9.8	10.2	10.6	10.2	11.3	11.8	12.3	12.8	10.8	12.0	12.5	13.1	13.6	11.2	12.5	13.1	13.6	14.2	12.4	13.9	14.5	15.1	15.8
	-20	7.4	8.2	8.5	8.8	9.2	9.0	10.0	10.4	10.8	11.2	9.5	10.6	11.1	11.5	12.0	10.0	11.1	11.6	12.0	12.6	11.0	12.4	12.9	13.4	14.0
	-15	6.2	6.8	7.1	7.4	7.7	7.7	8.5	8.8	9.2	9.6	8.2	9.1	9.5	9.9	10.3	8.6	9.6	10.0	10.4	10.8	9.6	10.8	11.2	11.7	12.2
	-10	5.4	6.0	6.2	6.5	6.7	6.8	7.6	7.9	8.2	8.6	7.4	8.2	8.5	8.9	9.3	7.8	8.6	9.0	9.4	9.8	8.7	9.8	10.2	10.6	11.1
	-5	16.7	18.7	19.5	20.4	21.3	19.0	21.5	22.4	23.5	24.6	19.9	22.5	23.5	24.6	25.9	20.5	23.2	24.3	25.4	26.7	22.2	25.2	26.3	27.6	29.1
	0	16.4	18.4	19.2	20.0	20.9	18.7	21.1	22.0	23.0	24.2	19.6	22.1	23.1	24.2	25.4	20.2	22.8	23.9	25.0	26.2	21.8	24.7	25.9	27.2	28.6
	5	16.1	18.0	18.8	19.6	20.5	18.4	20.7	21.6	22.6	23.7	19.3	21.7	22.7	23.8	24.9	19.9	22.4	23.5	24.5	25.8	21.5	24.3	25.5	26.7	28.0
	10	15.5	17.4	18.1	18.9	19.7	17.8	20.0	20.9	21.8	22.8	18.6	21.0	21.9	22.9	24.0	19.2	21.7	22.6	23.7	24.8	20.8	23.5	24.6	25.7	27.0
10000	-35	14.7	16.4	17.1	17.8	18.6	16.9	19.0	19.8	20.7	21.6	17.7	19.9	20.8	21.7	22.7	18.3	20.6	21.5	22.4	23.5	19.8	22.3	23.3	24.4	25.6
	-30	13.8	15.4	16.0	16.7	17.4	15.9	17.9	18.6	19.4	20.3	16.7	18.8	19.6	20.4	21.4	17.3	19.4	20.2	21.1	22.1	18.7	21.1	22.0	23.0	24.2
	-25	12.8	14.3	14.9	15.5	16.2	14.9	16.7	17.4	18.1	18.9	15.6	17.5	18.3	19.1	20.0	16.2	18.1	18.9	19.8	20.7	17.6	19.8	20.6	21.6	22.6
	-20	11.9	13.3	13.8	14.4	15.0	13.9	15.6	16.2	16.9	17.6	14.6	16.4	17.1	17.8	18.6	15.1	17.0	17.7	18.5	19.3	16.5	18.5	19.3	20.2	21.2
	-15	11.1	12.3	12.8	13.3	13.9	13.0	14.5	15.1	15.7	16.4	13.7	15.3	15.9	16.6	17.4	14.2	15.9	16.5	17.2	18.0	15.5	17.4	18.1	18.9	19.8
	-10	10.3	11.4	11.9	12.3	12.9	12.1	13.5	14.1	14.7	15.3	12.8	14.3	14.9	15.5	16.2	13.3	14.8	15.5	16.1	16.8	14.5	16.3	17.0	17.7	18.5
	-5	9.5	10.6	11.0	11.4	11.9	11.3	12.6	13.1	13.6	14.2	12.0	13.3	13.9	14.5	15.1	12.4	13.9	14.4	15.0	15.7	13.6	15.3	15.9	16.6	17.4
	0	8.6	9.6	9.9	10.3	10.7	10.3	11.5	11.9	12.4	13.0	10.9	12.2	12.7	13.2	13.8	11.4	12.7	13.2	13.8	14.4	12.5	14.0	14.6	15.2	15.9
	5	7.6	8.4	8.7	9.1	9.4	9.2	10.2	10.6	11.1	11.5	9.8	10.9	11.4	11.8	12.3	10.2	11.4	11.8	12.3	12.9	11.3	12.7	13.2	13.7	14.4
	10	6.6	7.3	7.5	7.8	8.1	8.1	9.0	9.3	9.7	10.1	8.7	9.6	10.0	10.4	10.9	9.1	10.1	10.5	10.9	11.4	10.1	11.3	11.7	12.2	12.8
11000	-35	5.3	5.9	6.1	6.3	6.6	6.8	7.5	7.8	8.1	8.4	7.3	8.1	8.4	8.8	9.1	7.7	8.5	8.9	9.2	9.6	8.7	9.7	10.0	10.5	10.9
	-30	16.1	18.0	18.8	19.6	20.5	18.4	20.7	21.7	22.6	23.7	19.3	21.8	22.8	23.8	25.0	19.9	22.5	23.5	24.6	25.8	21.6	24.4	25.5	26.8	28.1
	-25	15.7	17.6	18.3	19.1	19.9	18.0	20.2	21.1	22.0	23.1	18.9	21.2	22.2	23.2	24.3	19.5	21.9	22.9	24.0	25.1	21.1	23.8	24.9	26.1	27.4
	-20	15.3	17.1	17.8	18.5	19.4	17.5	19.7	20.5	21.4	22.4	18.4	20.7	21.6	22.6	23.6	19.0	21.4	22.3	23.3	24.5	20.6	23.2	24.3	25.4	26.6
	-15	14.4	16.1	16.8	17.5	18.3	16.6	18.7	19.4	20.3	21.2	17.5	19.6	20.5	21.4	22.4	18.0	20.3	21.2	22.1	23.2	19.5	22.0	23.0	24.1	25.3
	-10	13.6	15.2	15.8	16.4	17.1	15.7	17.6	18.3	19.1	20.0	16.5	18.5	19.3	20.2	21.1	17.1	19.2	20.0	20.9	21.9	18.5	20.9	21.8	22.8	23.9
	-5	12.7	14.2	14.7	15.3	16.0	14.8	16.5	17.2	18.0	18.8	15.6	17.4	18.2	19.0	19.8	16.1	18.0	18.8	19.6	20.5	17.5	19.7	20.5	21.4	22.5
	0	11.8	13.1	13.6	14.2	14.8	13.8	15.4	16.0	16.7	17.4	14.5	16.3	16.9	17.7	18.4	15.0	16.8	17.5	18.3	19.1	16.4	18.4	19.2	20.0	21.0
	5	10.9	12.2	12.6	13.1	13.7	12.8	14.3	14.9	15.5	16.2	13.6	15.2	15.8	16.4	17.2	14.1	15.7	16.4	17.1	17.8	15.4	17.2	18.0	18.7	19.6
	10	10.1	11.2	11.7	12.1	12.6	11.9	13.3	13.8	14.4	15.0	12.6	14.1	14.7	15.3	16.0	13.1	14.7	15.3	15.9	16.6	14.4	16.1	16.8	17.5	18.3
12000	-35	9.4	10.4	10.8	11.2	11.7	11.1	12.4	12.9	13.4	14.0	11.8	13.2	13.7	14.3	14.9	12.3	13.7	14.2	14.8	15.5	13.5	15.1	15.7	16.4	17.1
	-30	8.6	9.5	9.9	10.3	10.7	10.3	11.5	11.9	12.4	12.9	11.0	12.2	12.7	13.2	13.8	11.4	12.7	13.2	13.8	14.4	12.6	14.1	14.6	15.3	15.9
	-25	7.7	8.5	8.8	9.2	9.5	9.3	10.4	10.8	11.2	11.7	9.9	11.1	11.5	12.0	12.5	10.4	11.6	12.0	12.5	13.0	11.5	12.8	13.3	13.9	14.5
	-20	6.8	7.5	7.8	8.0	8.4	8.3	9.2	9.6	10.0	10.4	8.9	9.9	10.3	10.7	11.2	9.3	10.4	10.8	11.2	11.7	10.4	11.6	12.0	12.6	13.1
	-15	5.7	6.3	6.6	6.8	7.1	7.2	8.0	8.3	8.6	9.0	7.8	8.6	9.0	9.3	9.7	8.2	9.1	9.4	9.8	10.2	9.2	10.2	10.6	11.1	11.5
	-10	4.8	5.3	5.5	5.7	5.9	6.2	6.9	7.1	7.4	7.7	6.7	7.5	7.8	8.1	8.4	7.1	7.9	8.2	8.5	8.9	8.1	9.0	9.3	9.7	10.1



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
8	-35	24.4	27.9	29.3	30.8	32.5	26.5	30.4	31.9	33.7	35.6	28.9	33.2	35.0	37.0	39.1	31.5	36.5	38.5	40.8	43.3
0	-30	24.4	27.8	29.1	30.7	32.3	26.4	30.3	31.8	33.5	35.4	28.8	33.1	34.8	36.8	38.9	31.5	36.3	38.3	40.5	43.0
0	-25	24.3	27.7	29.0	30.5	32.1	26.4	30.1	31.6	33.3	35.2	28.7	32.9	34.6	36.5	38.7	31.3	36.2	38.1	40.3	42.8
0	-20	24.0	27.3	28.6	30.1	31.7	26.1	29.8	31.2	32.9	34.7	28.4	32.5	34.2	36.1	38.1	31.0	35.7	37.6	39.8	42.1
0	-15	22.9	26.0	27.2	28.5	30.0	24.8	28.3	29.7	31.2	32.9	27.0	30.9	32.5	34.2	36.2	29.6	34.0	35.8	37.8	40.0
0	-10	21.7	24.6	25.7	27.0	28.4	23.6	26.8	28.1	29.5	31.1	25.7	29.3	30.8	32.4	34.2	28.1	32.3	33.9	35.8	37.8
0	-5	20.4	23.1	24.2	25.3	26.6	22.2	25.2	26.4	27.8	29.2	24.3	27.7	29.0	30.5	32.2	26.6	30.4	32.0	33.7	35.6
0	0	19.2	21.7	22.7	23.8	25.0	21.0	23.8	24.9	26.1	27.5	22.9	26.1	27.4	28.7	30.3	25.1	28.7	30.2	31.8	33.6
0	5	18.1	20.5	21.4	22.4	23.5	19.8	22.4	23.5	24.6	25.8	21.7	24.6	25.8	27.1	28.5	23.8	27.2	28.5	30.0	31.7
0	10	17.1	19.2	20.1	21.0	22.0	18.7	21.1	22.1	23.2	24.3	20.5	23.3	24.4	25.6	26.9	22.5	25.7	26.9	28.3	29.9
0	15	16.1	18.1	18.9	19.8	20.7	17.7	19.9	20.8	21.8	22.9	19.4	22.0	23.0	24.1	25.4	21.4	24.3	25.5	26.8	28.2
0	20	15.1	16.9	17.7	18.5	19.4	16.6	18.7	19.5	20.4	21.4	18.2	20.6	21.6	22.6	23.8	20.1	22.9	24.0	25.2	26.5
0	25	13.7	15.3	16.0	16.7	17.5	15.1	17.0	17.7	18.6	19.5	16.7	18.8	19.7	20.6	21.7	18.4	20.9	21.9	23.0	24.2
0	30	12.3	13.8	14.3	15.0	15.7	13.6	15.3	16.0	16.7	17.5	15.1	17.0	17.8	18.7	19.6	16.8	19.0	19.9	20.9	21.9
0	35	10.8	12.1	12.6	13.1	13.7	12.0	13.5	14.1	14.7	15.4	13.4	15.2	15.8	16.6	17.4	15.0	17.0	17.8	18.6	19.6
0	37	9.8	11.0	11.5	12.0	12.5	11.1	12.4	13.0	13.5	14.2	12.4	14.0	14.6	15.3	16.0	13.9	15.8	16.5	17.3	18.1
9	-35	24.0	27.3	28.7	30.1	31.7	26.1	29.8	31.3	32.9	34.8	28.4	32.6	34.3	36.1	38.2	31.0	35.8	37.7	39.9	42.3
0	-30	23.6	26.9	28.2	29.6	31.2	25.7	29.3	30.8	32.4	34.1	28.0	32.1	33.7	35.5	37.6	30.6	35.2	37.1	39.2	41.5
0	-25	23.3	26.5	27.7	29.1	30.6	25.3	28.8	30.2	31.8	33.5	27.6	31.5	33.1	34.9	36.9	30.1	34.6	36.5	38.5	40.8
0	-20	22.5	25.6	26.8	28.1	29.5	24.5	27.9	29.2	30.7	32.3	26.7	30.5	32.0	33.7	35.6	29.2	33.5	35.2	37.2	39.3
0	-15	21.5	24.3	25.4	26.7	28.0	23.3	26.5	27.8	29.2	30.7	25.5	29.0	30.5	32.0	33.8	27.8	31.9	33.6	35.4	37.4
0	-10	20.3	23.0	24.0	25.2	26.4	22.1	25.1	26.3	27.6	29.0	24.2	27.5	28.9	30.3	32.0	26.5	30.3	31.8	33.5	35.4
0	-5	19.1	21.6	22.6	23.6	24.8	20.9	23.6	24.7	25.9	27.3	22.8	25.9	27.2	28.5	30.1	25.0	28.6	30.0	31.6	33.3
0	0	18.0	20.3	21.2	22.2	23.3	19.7	22.2	23.3	24.4	25.6	21.5	24.4	25.6	26.9	28.3	23.6	27.0	28.3	29.7	31.3
0	5	16.9	19.1	19.9	20.8	21.8	18.5	20.9	21.9	22.9	24.0	20.3	23.0	24.1	25.3	26.6	22.4	25.5	26.7	28.0	29.5
0	10	15.9	17.9	18.7	19.5	20.5	17.5	19.7	20.6	21.6	22.6	19.2	21.7	22.7	23.8	25.1	21.2	24.1	25.2	26.5	27.9
0	15	15.0	16.8	17.5	18.3	19.2	16.5	18.6	19.4	20.3	21.2	18.1	20.5	21.4	22.5	23.6	20.0	22.7	23.8	25.0	26.3
0	20	13.8	15.5	16.2	16.9	17.7	15.3	17.2	17.9	18.7	19.6	16.9	19.0	19.9	20.8	21.9	18.6	21.1	22.1	23.2	24.4
0	25	12.5	14.1	14.7	15.3	16.0	13.9	15.6	16.3	17.0	17.8	15.4	17.4	18.2	19.0	19.9	17.1	19.4	20.3	21.3	22.3
0	30	11.3	12.6	13.1	13.7	14.3	12.6	14.1	14.7	15.4	16.1	14.0	15.8	16.5	17.2	18.0	15.6	17.6	18.4	19.3	20.3
0	35	9.7	10.9	11.3	11.8	12.4	11.0	12.3	12.8	13.4	14.0	12.3	13.8	14.4	15.1	15.8	13.8	15.6	16.3	17.1	17.9
1	-35	23.4	26.5	27.8	29.2	30.7	25.4	28.9	30.3	31.9	33.6	27.6	31.6	33.2	35.0	37.0	30.2	34.8	36.6	38.6	40.9
0	-30	22.8	25.9	27.1	28.4	29.9	24.8	28.2	29.6	31.1	32.8	27.0	30.9	32.4	34.1	36.0	29.6	33.9	35.7	37.7	39.9
0	-25	22.3	25.2	26.4	27.7	29.1	24.2	27.5	28.9	30.3	31.9	26.4	30.1	31.6	33.3	35.1	28.9	33.1	34.8	36.7	38.8
0	-20	21.2	24.0	25.1	26.3	27.6	23.1	26.2	27.4	28.8	30.3	25.2	28.7	30.1	31.6	33.3	27.6	31.5	33.1	34.9	36.9
0	-15	20.1	22.7	23.8	24.9	26.1	21.9	24.8	26.0	27.3	28.7	23.9	27.2	28.5	30.0	31.6	26.2	29.9	31.4	33.1	34.9
0	-10	19.0	21.5	22.4	23.5	24.6	20.8	23.5	24.6	25.8	27.1	22.7	25.8	27.0	28.3	29.8	24.9	28.4	29.8	31.3	33.0
0	-5	17.9	20.1	21.0	22.0	23.0	19.5	22.1	23.1	24.2	25.4	21.4	24.3	25.4	26.6	28.0	23.5	26.8	28.0	29.5	31.1
0	0	16.8	18.9	19.7	20.6	21.6	18.4	20.7	21.7	22.7	23.8	20.2	22.8	23.9	25.1	26.3	22.2	25.2	26.4	27.8	29.2
0	5	15.8	17.7	18.5	19.3	20.2	17.3	19.5	20.3	21.3	22.3	19.0	21.5	22.5	23.6	24.7	21.0	23.8	24.9	26.1	27.5
0	10	14.8	16.6	17.3	18.1	18.9	16.3	18.3	19.1	20.0	21.0	18.0	20.3	21.2	22.2	23.3	19.8	22.5	23.5	24.7	25.9
0	15	13.9	15.6	16.2	16.9	17.7	15.3	17.2	17.9	18.8	19.6	16.9	19.1	19.9	20.8	21.9	18.7	21.2	22.2	23.2	24.4
0	20	12.7	14.2	14.8	15.5	16.2	14.1	15.8	16.5	17.2	18.0	15.6	17.6	18.4	19.2	20.1	17.3	19.6	20.5	21.5	22.5
0	25	11.6	12.9	13.5	14.0	14.7	12.9	14.4	15.0	15.7	16.4	14.3	16.1	16.8	17.6	18.4	15.9	18.0	18.8	19.7	20.7
0	30	10.3	11.5	12.0	12.5	13.0	11.5	12.9	13.4	14.0	14.7	12.9	14.5	15.1	15.8	16.5	14.4	16.3	17.0	17.8	18.7
0	33	9.1	10.2	10.6	11.1	11.5	10.3	11.5	12.0	12.5	13.1	11.6	13.0	13.6	14.2	14.9	13.1	14.7	15.4	16.1	16.9
1	-35	22.1	25.1	26.2	27.5	28.9	24.1	27.4	28.7	30.1	31.7	26.2	29.9	31.4	33.1	34.9	28.7	32.9	34.6	36.5	38.6
0	-30	21.6	24.5	25.6	26.8	28.2	23.5	26.7	28.0	29.4	30.9	25.7	29.3	30.7	32.3	34.0	28.1	32.2	33.8	35.6	37.6
0	-25	20.9	23.7	24.7	25.9	27.2	22.8	25.8	27.0	28.4	29.8	24.9	28.3	29.7	31.2	32.8	27.2	31.1	32.7	34.4	36.3
0	-20	19.9	22.4	23.4	24.5	25.7	21.7	24.5	25.6	26.9	28.2	23.7	26.9	28.2	29.6	31.1	25.9	29.6	31.0	32.7	34.4
0	-15	18.8	21.2	22.2	23.2	24.3	20.6	23.2	24.3	25.4	26.7	22.5	25.5	26.7	28.0	29.5	24.6	28.1	29.4	30.9	32.6
0	-10	17.8	20.0	20.9	21.9	22.9	19.5	22.0	22.9	24.0	25.2	21.3	24.1	25.2	26.5	27.8	23.4	26.6	27.9	29.3	30.8
0	-5	16.7	18.7	19.5	20.4	21.4	18.3	20.6	21.5	22.5	23.6	20.0	22.7	23.7	24.8	26.1	22.1	25.0	26.2	27.5	29.0
0	0	15.6	17.5	18.3	19.1	20.0	17.2	19.3	20.2	21.1	22.1	18.9	21.3	22.3	23.3	24.5	20.8	23.6	24.7	25.9	27.2
0	5	14.7	16.4	17.1	17.9	18.7	16.1	18.1	18.9	19.8	20.7	17.8	20.1	21.0	21.9	23.0	19.6	22.2	23.3	24.4	25.6
0	10	13.7	15.4	16.0	16.7	17.5	15.2	17.0	17.7	18.5	19.4	16.7	18.9	19.7	20.6	21.6	18.5	21.0	21.9	23.0	24.1
0	15	12.8	14.3	14.9	15.5	16.2	14.1	15.8	16.5	17.2	18.0	15.6	17.6	18.4	19.2	20.1	17.4	19.6	20.5	21.5	22.5



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		*12375					11500					11200					11000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	14.1	15.8	16.4	17.1	17.8	16.3	18.2	19.0	19.8	20.7	17.1	19.2	20.0	20.9	21.9	17.7	19.9	20.7	21.6	22.7
2	-30	13.8	15.4	16.0	16.6	17.4	15.9	17.8	18.6	19.4	20.2	16.7	18.8	19.5	20.4	21.3	17.3	19.4	20.2	21.1	22.1
0	-25	13.1	14.6	15.1	15.8	16.4	15.2	17.0	17.6	18.4	19.2	16.0	17.9	18.6	19.4	20.3	16.5	18.5	19.3	20.1	21.0
0	-20	12.3	13.7	14.2	14.8	15.4	14.3	15.9	16.6	17.3	18.0	15.1	16.8	17.5	18.3	19.1	15.6	17.4	18.2	18.9	19.8
0	-15	11.5	12.8	13.3	13.8	14.4	13.5	15.0	15.6	16.2	16.9	14.2	15.8	16.5	17.2	17.9	14.7	16.4	17.1	17.8	18.6
0	-10	10.7	11.9	12.3	12.8	13.3	12.6	14.0	14.6	15.2	15.8	13.3	14.8	15.4	16.1	16.8	13.8	15.4	16.0	16.7	17.4
0	-5	9.9	10.9	11.3	11.8	12.3	11.7	13.0	13.5	14.0	14.6	12.4	13.8	14.3	14.9	15.5	12.8	14.3	14.9	15.5	16.2
0	0	9.1	10.0	10.4	10.8	11.2	10.8	12.0	12.5	13.0	13.5	11.5	12.8	13.3	13.8	14.4	11.9	13.3	13.8	14.4	15.0
0	5	8.3	9.2	9.5	9.9	10.3	10.0	11.1	11.5	12.0	12.5	10.6	11.8	12.3	12.8	13.3	11.1	12.3	12.8	13.3	13.9
0	10	7.6	8.4	8.7	9.0	9.4	9.2	10.2	10.6	11.0	11.5	9.8	10.9	11.3	11.8	12.3	10.3	11.4	11.8	12.3	12.8
0	15	6.8	7.5	7.8	8.1	8.4	8.4	9.3	9.6	10.0	10.4	9.0	10.0	10.3	10.7	11.2	9.4	10.4	10.8	11.3	11.7
0	20	6.0	6.7	6.9	7.2	7.4	7.6	8.4	8.7	9.0	9.4	8.1	9.0	9.3	9.7	10.1	8.5	9.5	9.8	10.2	10.6
0	25	5.2	5.8	6.0	6.2	6.4	6.7	7.4	7.7	7.9	8.3	7.2	8.0	8.3	8.6	9.0	7.6	8.4	8.7	9.1	9.5
0	29	4.2	4.6	4.7	4.9	5.1	5.5	6.1	6.3	6.6	6.8	6.0	6.7	6.9	7.2	7.5	6.4	7.1	7.3	7.6	7.9
3	-35	13.2	14.7	15.3	15.9	16.6	15.3	17.1	17.8	18.5	19.4	16.1	18.0	18.7	19.6	20.4	16.6	18.6	19.4	20.3	21.2
3	-30	12.8	14.3	14.8	15.4	16.1	14.9	16.6	17.3	18.0	18.8	15.7	17.5	18.2	19.0	19.9	16.2	18.1	18.9	19.7	20.6
0	-25	12.0	13.4	13.9	14.4	15.0	14.0	15.6	16.3	16.9	17.7	14.8	16.5	17.2	17.9	18.7	15.3	17.1	17.8	18.6	19.4
0	-20	11.3	12.5	13.0	13.5	14.0	13.2	14.7	15.3	15.9	16.6	13.9	15.5	16.1	16.8	17.5	14.4	16.1	16.8	17.5	18.2
0	-15	10.5	11.7	12.1	12.6	13.1	12.4	13.8	14.3	14.9	15.5	13.1	14.6	15.2	15.8	16.5	13.6	15.1	15.7	16.4	17.1
0	-10	9.7	10.8	11.2	11.6	12.1	11.6	12.8	13.3	13.9	14.4	12.2	13.6	14.2	14.7	15.3	12.7	14.2	14.7	15.3	16.0
0	-5	8.9	9.9	10.2	10.6	11.0	10.7	11.8	12.3	12.8	13.3	11.3	12.6	13.1	13.6	14.2	11.8	13.1	13.6	14.2	14.8
0	0	8.1	9.0	9.3	9.7	10.1	9.8	10.9	11.3	11.7	12.2	10.5	11.6	12.1	12.5	13.1	10.9	12.1	12.6	13.1	13.6
0	5	7.4	8.2	8.5	8.8	9.2	9.1	10.0	10.4	10.8	11.2	9.7	10.7	11.1	11.6	12.0	10.1	11.2	11.6	12.1	12.6
0	10	6.7	7.4	7.7	8.0	8.3	8.3	9.2	9.5	9.9	10.3	8.9	9.8	10.2	10.6	11.0	9.3	10.3	10.7	11.1	11.6
0	15	6.0	6.6	6.9	7.1	7.4	7.5	8.3	8.6	9.0	9.3	8.1	9.0	9.3	9.7	10.0	8.5	9.4	9.8	10.2	10.6
0	20	5.3	5.9	6.1	6.3	6.5	6.8	7.5	7.7	8.0	8.4	7.3	8.1	8.4	8.7	9.1	7.7	8.5	8.8	9.2	9.6
0	25	4.4	4.8	5.0	5.2	5.3	5.7	6.3	6.6	6.8	7.1	6.3	6.9	7.2	7.5	7.7	6.6	7.3	7.6	7.9	8.2
0	29	3.8	4.2	4.4	4.5	4.7	5.2	5.7	5.9	6.1	6.4	5.7	6.3	6.5	6.7	7.0	6.0	6.7	6.9	7.2	7.4
4	-35	12.3	13.7	14.2	14.8	15.4	14.3	16.0	16.6	17.3	18.0	15.1	16.8	17.5	18.3	19.1	15.6	17.5	18.2	18.9	19.8
4	-30	11.8	13.1	13.6	14.1	14.7	13.7	15.3	15.9	16.6	17.3	14.5	16.2	16.8	17.5	18.3	15.0	16.8	17.4	18.2	19.0
0	-25	11.0	12.2	12.7	13.2	13.7	12.9	14.4	14.9	15.5	16.2	13.6	15.2	15.8	16.4	17.1	14.1	15.8	16.4	17.1	17.8
0	-20	10.3	11.4	11.8	12.2	12.7	12.1	13.5	14.0	14.5	15.1	12.8	14.3	14.8	15.4	16.1	13.3	14.8	15.4	16.0	16.7
0	-15	9.6	10.6	11.0	11.4	11.8	11.3	12.6	13.1	13.6	14.1	12.0	13.4	13.9	14.4	15.0	12.5	13.9	14.4	15.0	15.7
0	-10	8.8	9.7	10.1	10.5	10.9	10.5	11.7	12.1	12.6	13.1	11.2	12.4	12.9	13.4	14.0	11.6	12.9	13.4	14.0	14.6
0	-5	8.0	8.8	9.2	9.5	9.9	9.7	10.7	11.1	11.6	12.0	10.3	11.4	11.9	12.3	12.8	10.8	11.9	12.4	12.9	13.4
0	0	7.3	8.0	8.3	8.6	9.0	8.9	9.8	10.2	10.6	11.0	9.5	10.5	10.9	11.3	11.8	9.9	11.0	11.4	11.9	12.4
0	5	6.6	7.3	7.5	7.8	8.1	8.1	9.0	9.3	9.7	10.1	8.7	9.7	10.0	10.4	10.8	9.1	10.1	10.5	10.9	11.4
0	10	5.9	6.5	6.8	7.0	7.3	7.4	8.2	8.5	8.8	9.2	8.0	8.8	9.2	9.5	9.9	8.4	9.3	9.6	10.0	10.4
0	15	5.3	5.8	6.0	6.2	6.5	6.7	7.4	7.7	8.0	8.3	7.3	8.1	8.3	8.7	9.0	7.7	8.5	8.8	9.1	9.5
0	20	4.7	5.1	5.3	5.5	5.7	6.1	6.7	6.9	7.2	7.4	6.6	7.3	7.5	7.8	8.1	7.0	7.7	8.0	8.3	8.6
0	25	3.5	3.9	4.0	4.1	4.3	4.8	5.3	5.5	5.7	5.9	5.3	5.9	6.1	6.3	6.6	5.7	6.3	6.5	6.7	7.0

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM  
DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-50 (Sheet 7)



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - OFF  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	20.9	23.6	24.7	25.9	27.2	22.8	25.8	27.0	28.3	29.8	24.8	28.3	29.6	31.1	32.8	27.2	31.1	32.7	34.4	36.3
2	-30	20.5	23.1	24.2	25.3	26.5	22.3	25.3	26.4	27.7	29.1	24.4	27.7	29.0	30.5	32.1	26.7	30.5	32.0	33.6	35.5
0	-25	19.6	22.1	23.1	24.1	25.3	21.4	24.2	25.3	26.5	27.8	23.4	26.5	27.7	29.1	30.6	25.6	29.2	30.6	32.2	33.9
0	-20	18.6	20.9	21.8	22.8	23.9	20.3	22.9	23.9	25.0	26.3	22.2	25.1	26.3	27.6	29.0	24.3	27.7	29.0	30.5	32.1
0	-15	17.6	19.8	20.6	21.5	22.6	19.2	21.7	22.6	23.7	24.8	21.1	23.8	24.9	26.1	27.4	23.1	26.3	27.5	28.9	30.4
0	-10	16.6	18.6	19.4	20.3	21.2	18.2	20.4	21.3	22.3	23.4	19.9	22.5	23.5	24.6	25.9	21.9	24.9	26.0	27.3	28.7
	-5	15.5	17.4	18.1	18.9	19.8	17.1	19.2	20.0	20.9	21.9	18.7	21.2	22.1	23.1	24.3	20.7	23.4	24.5	25.7	27.0
	0	14.5	16.3	16.9	17.7	18.5	16.0	17.9	18.7	19.5	20.5	17.6	19.8	20.7	21.7	22.7	19.5	22.0	23.0	24.1	25.3
	5	13.6	15.2	15.8	16.5	17.2	15.0	16.8	17.5	18.3	19.1	16.6	18.6	19.5	20.3	21.3	18.3	20.7	21.6	22.7	23.8
	10	12.7	14.1	14.7	15.3	16.0	14.0	15.7	16.4	17.1	17.9	15.5	17.5	18.2	19.0	19.9	17.3	19.5	20.3	21.3	22.3
	15	11.7	13.1	13.6	14.2	14.8	13.0	14.6	15.2	15.8	16.5	14.5	16.3	16.9	17.7	18.5	16.1	18.2	19.0	19.8	20.8
	20	10.7	12.0	12.5	13.0	13.5	12.0	13.4	14.0	14.6	15.2	13.4	15.0	15.7	16.3	17.1	15.0	16.8	17.6	18.4	19.3
	25	9.7	10.8	11.3	11.7	12.2	10.9	12.2	12.7	13.2	13.8	12.3	13.7	14.3	14.9	15.6	13.8	15.5	16.1	16.9	17.7
	29	8.4	9.3	9.7	10.1	10.5	9.5	10.6	11.1	11.5	12.0	10.8	12.1	12.6	13.1	13.7	12.2	13.7	14.3	14.9	15.6
1	-35	19.8	22.3	23.3	24.3	25.5	21.6	24.4	25.5	26.7	28.0	23.6	26.7	28.0	29.4	30.9	25.8	29.5	30.9	32.5	34.2
3	-30	19.3	21.7	22.7	23.7	24.8	21.1	23.8	24.9	26.0	27.3	23.0	26.1	27.3	28.7	30.1	25.3	28.8	30.1	31.7	33.4
0	-25	18.3	20.6	21.5	22.4	23.5	20.0	22.6	23.6	24.7	25.9	21.9	24.8	25.9	27.2	28.5	24.0	27.3	28.6	30.0	31.6
0	-20	17.3	19.4	20.3	21.2	22.1	19.0	21.3	22.3	23.3	24.4	20.8	23.5	24.5	25.7	27.0	22.8	25.9	27.1	28.4	29.9
0	-15	16.4	18.4	19.1	20.0	20.9	18.0	20.2	21.1	22.0	23.1	19.7	22.2	23.2	24.3	25.5	21.7	24.6	25.7	26.9	28.3
0	-10	15.4	17.3	18.0	18.8	19.6	17.0	19.0	19.8	20.7	21.7	18.6	21.0	21.9	22.9	24.0	20.5	23.2	24.3	25.5	26.7
	-5	14.4	16.1	16.7	17.5	18.2	15.8	17.8	18.5	19.3	20.2	17.5	19.7	20.5	21.4	22.5	19.3	21.8	22.8	23.9	25.0
	0	13.4	15.0	15.6	16.2	17.0	14.8	16.6	17.3	18.1	18.9	16.4	18.4	19.2	20.1	21.0	18.2	20.5	21.4	22.4	23.5
	5	12.5	14.0	14.5	15.1	15.8	13.9	15.5	16.2	16.9	17.6	15.4	17.3	18.0	18.8	19.7	17.1	19.3	20.1	21.0	22.0
	10	11.6	13.0	13.5	14.0	14.6	12.9	14.5	15.1	15.7	16.4	14.4	16.1	16.8	17.6	18.4	16.0	18.0	18.8	19.7	20.6
	15	10.7	12.0	12.4	12.9	13.5	12.0	13.4	14.0	14.5	15.2	13.4	15.0	15.6	16.3	17.1	15.0	16.8	17.6	18.4	19.2
	20	9.9	11.0	11.4	11.9	12.4	11.1	12.4	12.9	13.4	14.0	12.4	13.9	14.5	15.1	15.8	13.9	15.6	16.3	17.0	17.8
	25	8.7	9.6	10.0	10.4	10.9	9.8	11.0	11.4	11.9	12.4	11.1	12.4	12.9	13.5	14.1	12.5	14.1	14.6	15.3	16.0
	27	8.0	8.9	9.2	9.6	10.0	9.1	10.2	10.6	11.0	11.5	10.4	11.6	12.0	12.6	13.1	11.7	13.2	13.7	14.3	15.0
1	-35	18.6	20.9	21.8	22.8	23.9	20.4	23.0	24.0	25.1	26.4	22.3	25.3	26.4	27.7	29.1	24.5	27.8	29.2	30.6	32.2
4	-30	18.0	20.2	21.0	22.0	23.0	19.7	22.2	23.1	24.2	25.4	21.6	24.4	25.5	26.7	28.0	23.7	26.9	28.1	29.5	31.1
0	-25	17.0	19.1	19.9	20.7	21.7	18.7	21.0	21.9	22.9	24.0	20.5	23.1	24.1	25.3	26.5	22.5	25.5	26.7	28.0	29.4
0	-20	16.1	18.0	18.7	19.5	20.4	17.7	19.8	20.7	21.6	22.6	19.4	21.9	22.8	23.9	25.1	21.4	24.2	25.3	26.5	27.8
0	-15	15.2	17.0	17.7	18.4	19.2	16.7	18.8	19.6	20.4	21.4	18.4	20.7	21.6	22.6	23.7	20.3	22.9	24.0	25.1	26.3
0	-10	14.2	15.9	16.5	17.2	18.0	15.7	17.6	18.4	19.2	20.0	17.3	19.5	20.3	21.2	22.2	19.2	21.6	22.6	23.6	24.8
	-5	13.2	14.8	15.4	16.0	16.7	14.7	16.4	17.1	17.8	18.7	16.2	18.2	19.0	19.9	20.8	18.0	20.3	21.2	22.1	23.2
	0	12.3	13.7	14.3	14.9	15.5	13.7	15.3	16.0	16.6	17.4	15.2	17.1	17.8	18.6	19.4	16.9	19.0	19.9	20.8	21.7
	5	11.5	12.8	13.3	13.8	14.4	12.8	14.3	14.9	15.5	16.2	14.3	16.0	16.6	17.3	18.1	15.9	17.8	18.6	19.4	20.4
	10	10.6	11.8	12.3	12.8	13.3	11.9	13.3	13.8	14.4	15.0	13.3	14.9	15.5	16.2	16.9	14.9	16.7	17.4	18.2	19.0
	15	9.8	10.9	11.3	11.8	12.3	11.1	12.4	12.8	13.4	13.9	12.4	13.9	14.5	15.1	15.7	13.9	15.6	16.3	17.0	17.8
	20	9.0	10.0	10.4	10.8	11.3	10.2	11.4	11.9	12.3	12.9	11.5	12.9	13.4	14.0	14.6	13.0	14.6	15.2	15.8	16.5
	25	7.6	8.5	8.8	9.1	9.5	8.8	9.7	10.1	10.5	11.0	10.0	11.1	11.6	12.1	12.6	11.3	12.7	13.2	13.8	14.4

FAA-8040-10

Figure 4-50 (Sheet 8)



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		*12375					11500					11200					11000					10500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-35	15.2	17.4	18.3	19.2	20.3	17.4	20.0	21.1	22.3	23.6	18.2	21.0	22.2	23.4	24.8	18.8	21.7	22.9	24.2	25.7	20.4	23.7	25.0	26.5	28.1
	-30	15.2	17.4	18.2	19.2	20.3	17.4	20.0	21.0	22.2	23.5	18.2	21.0	22.1	23.4	24.8	18.8	21.7	22.9	24.2	25.6	20.4	23.6	24.9	26.4	28.0
	-25	15.2	17.4	18.2	19.2	20.2	17.4	20.0	21.0	22.2	23.5	18.3	21.0	22.1	23.3	24.7	18.9	21.7	22.9	24.2	25.6	20.5	23.6	24.9	26.4	28.0
	-20	15.2	17.4	18.2	19.2	20.2	17.5	20.0	21.0	22.2	23.4	18.3	21.0	22.1	23.3	24.7	18.9	21.7	22.9	24.1	25.6	20.5	23.6	24.9	26.4	28.0
	-15	15.3	17.4	18.2	19.2	20.2	17.5	20.0	21.0	22.2	23.4	18.3	21.0	22.1	23.3	24.7	18.9	21.8	22.9	24.1	25.5	20.5	23.7	24.9	26.3	27.9
	-10	15.3	17.4	18.2	19.2	20.2	17.5	20.1	21.1	22.2	23.4	18.4	21.1	22.1	23.3	24.7	19.0	21.8	22.9	24.1	25.5	20.6	23.7	24.9	26.3	27.9
	-5	15.3	17.4	18.3	19.2	20.2	17.6	20.1	21.1	22.2	23.4	18.4	21.1	22.2	23.3	24.6	19.0	21.8	22.9	24.1	25.5	20.6	23.7	25.0	26.3	27.9
	0	15.1	17.1	18.0	18.8	19.8	17.3	19.8	20.7	21.8	23.0	18.2	20.8	21.8	23.0	24.2	18.8	21.5	22.6	23.8	25.1	20.4	23.4	24.6	25.9	27.4
	5	14.9	16.9	17.7	18.5	19.5	17.1	19.5	20.4	21.5	22.6	17.9	20.5	21.5	22.6	23.8	18.5	21.1	22.2	23.4	24.7	20.1	23.0	24.2	25.5	27.0
	10	12.9	14.7	15.3	16.1	16.9	15.0	17.1	17.9	18.8	19.8	15.8	18.0	18.9	19.8	20.9	16.3	18.6	19.5	20.6	21.7	17.8	20.4	21.4	22.5	23.8
1	-35	15.0	17.1	18.0	18.9	19.9	17.2	19.7	20.8	21.9	23.2	18.0	20.7	21.8	23.0	24.4	18.6	21.4	22.6	23.8	25.3	20.2	23.3	24.6	26.0	27.6
	-30	15.0	17.1	17.9	18.9	19.9	17.2	19.7	20.7	21.8	23.1	18.0	20.7	21.8	23.0	24.3	18.6	21.4	22.5	23.8	25.2	20.2	23.3	24.6	26.0	27.6
	-25	15.0	17.1	17.9	18.9	19.9	17.2	19.7	20.7	21.8	23.1	18.1	20.7	21.8	23.0	24.3	18.6	21.4	22.5	23.8	25.2	20.2	23.3	24.6	26.0	27.5
	-20	15.0	17.1	17.9	18.8	19.8	17.2	19.7	20.7	21.8	23.0	18.1	20.7	21.8	23.0	24.3	18.7	21.4	22.5	23.8	25.1	20.3	23.3	24.6	25.9	27.5
	-15	15.1	17.1	17.9	18.8	19.8	17.3	19.7	20.7	21.8	23.0	18.1	20.7	21.8	23.0	24.2	18.7	21.5	22.5	23.8	25.1	20.3	23.3	24.6	25.9	27.5
	-10	15.1	17.1	18.0	18.8	19.8	17.3	19.8	20.7	21.8	23.0	18.2	20.8	21.8	23.0	24.2	18.8	21.5	22.6	23.8	25.1	20.4	23.4	24.6	25.9	27.4
	-5	15.0	17.0	17.8	18.7	19.7	17.2	19.7	20.6	21.7	22.8	18.1	20.7	21.7	22.8	24.1	18.7	21.4	22.4	23.6	24.9	20.3	23.2	24.4	25.8	27.2
	0	14.8	16.7	17.5	18.4	19.3	17.0	19.3	20.3	21.3	22.4	17.8	20.3	21.3	22.4	23.6	18.4	21.0	22.1	23.2	24.5	20.0	22.9	24.0	25.3	26.8
	5	13.9	15.7	16.4	17.2	18.1	16.0	18.2	19.0	20.0	21.0	16.8	19.1	20.1	21.1	22.2	17.4	19.8	20.8	21.8	23.0	18.9	21.6	22.7	23.9	25.2
	10	12.0	13.6	14.2	14.9	15.6	14.0	15.9	16.6	17.4	18.3	14.7	16.7	17.5	18.4	19.4	15.3	17.4	18.2	19.1	20.1	16.7	19.0	20.0	21.0	22.2
2	-35	14.9	17.0	17.8	18.7	19.7	17.1	19.6	20.6	21.7	22.9	17.9	20.6	21.6	22.8	24.1	18.5	21.3	22.4	23.6	25.0	20.1	23.1	24.4	25.8	27.3
	-30	14.9	16.9	17.8	18.7	19.7	17.1	19.6	20.5	21.6	22.8	17.9	20.5	21.6	22.8	24.1	18.5	21.2	22.3	23.6	24.9	20.1	23.1	24.4	25.7	27.3
	-25	14.9	16.9	17.8	18.6	19.6	17.1	19.5	20.5	21.6	22.8	18.0	20.5	21.6	22.7	24.0	18.5	21.2	22.3	23.5	24.9	20.1	23.1	24.3	25.7	27.2
	-20	14.9	17.0	17.8	18.6	19.6	17.1	19.6	20.5	21.6	22.8	18.0	20.6	21.6	22.7	24.0	18.6	21.3	22.3	23.5	24.8	20.1	23.1	24.3	25.7	27.2
	-15	15.0	17.0	17.8	18.6	19.6	17.2	19.6	20.5	21.6	22.8	18.0	20.6	21.6	22.7	24.0	18.6	21.3	22.3	23.5	24.8	20.2	23.2	24.4	25.7	27.2
	-10	15.0	17.0	17.8	18.6	19.6	17.2	19.6	20.6	21.6	22.7	18.1	20.6	21.6	22.7	24.0	18.7	21.3	22.4	23.5	24.8	20.2	23.2	24.4	25.7	27.1
	-5	14.8	16.7	17.5	18.3	19.3	17.0	19.3	20.2	21.3	22.4	17.8	20.3	21.3	22.4	23.6	18.4	21.0	22.0	23.2	24.4	20.0	22.9	24.0	25.3	26.7
	0	14.5	16.4	17.1	17.9	18.8	16.7	18.9	19.8	20.8	21.9	17.5	19.9	20.9	21.9	23.1	18.1	20.6	21.6	22.7	23.9	19.6	22.4	23.6	24.8	26.2
	5	12.9	14.5	15.2	15.9	16.7	14.9	16.9	17.7	18.6	19.5	15.7	17.8	18.7	19.6	20.6	16.2	18.5	19.4	20.3	21.4	17.7	20.2	21.2	22.3	23.5
	10	11.1	12.5	13.0	13.7	14.3	13.0	14.7	15.4	16.1	16.9	13.7	15.5	16.3	17.1	17.9	14.2	16.1	16.9	17.7	18.7	15.6	17.7	18.6	19.5	20.6
3	-35	15.0	17.0	17.9	18.8	19.8	17.2	19.7	20.6	21.7	22.9	18.0	20.7	21.7	22.9	24.2	18.6	21.4	22.4	23.7	25.0	20.2	23.2	24.5	25.8	27.3
	-30	15.0	17.0	17.8	18.7	19.7	17.2	19.6	20.6	21.7	22.9	18.1	20.6	21.7	22.8	24.1	18.6	21.3	22.4	23.6	25.0	20.2	23.2	24.4	25.8	27.3
	-25	15.0	17.0	17.8	18.7	19.7	17.2	19.6	20.6	21.7	22.8	18.1	20.6	21.7	22.8	24.0	18.7	21.3	22.4	23.6	24.9	20.2	23.2	24.4	25.7	27.2
	-20	15.0	17.0	17.8	18.7	19.7	17.3	19.7	20.6	21.6	22.8	18.1	20.6	21.7	22.8	24.0	18.7	21.4	22.4	23.6	24.9	20.3	23.2	24.4	25.7	27.2
	-15	15.1	17.1	17.8	18.7	19.7	17.3	19.7	20.6	21.6	22.8	18.1	20.7	21.7	22.8	24.0	18.7	21.4	22.4	23.6	24.9	20.3	23.3	24.4	25.7	27.2
	-10	15.0	17.0	17.8	18.6	19.5	17.2	19.6	20.5	21.5	22.7	18.1	20.6	21.6	22.7	23.9	18.7	21.3	22.3	23.5	24.7	20.3	23.2	24.3	25.6	27.0
	-5	14.6	16.5	17.3	18.1	19.0	16.8	19.1	20.0	21.0	22.0	17.7	20.1	21.0	22.1	23.2	18.2	20.7	21.7	22.8	24.1	19.8	22.6	23.7	24.9	26.3
	0	13.9	15.7	16.4	17.2	18.0	16.0	18.2	19.0	20.0	21.0	16.9	19.1	20.0	21.0	22.1	17.4	19.8	20.7	21.8	22.9	18.9	21.6	22.7	23.8	25.1
	5	11.9	13.4	14.0	14.6	15.4	13.9	15.7	16.4	17.2	18.1	14.6	16.6	17.3	18.2	19.1	15.1	17.2	18.0	18.9	19.8	16.5	18.8	19.7	20.7	21.8
	10	10.2	11.5	12.0	12.5	13.1	12.0	13.6	14.2	14.9	15.6	12.7	14.4	15.0	15.8	16.6	13.2	14.9	15.6	16.4	17.2	14.5	16.5	17.2	18.1	19.0
4	-35	15.1	17.1	17.9	18.8	19.8	17.3	19.7	20.7	21.8	23.0	18.2	20.7	21.8	22.9	24.2	18.8	21.4	22.5	23.7	25.0	20.3	23.3	24.5	25.9	27.4
	-30	15.1	17.1	17.9	18.8	19.8	17.3	19.7	20.7	21.7	22.9	18.2	20.7	21.7	22.9	24.1	18.8	21.4	22.5	23.7	25.0	20.3	23.3	24.5	25.8	27.3
	-25	15.1	17.1	17.9	18.8	19.7	17.3	19.7	20.7	21.7	22.9	18.2	20.7	21.7	22.8	24.1	18.8	21.4	22.5	23.6	24.9	20.4	23.3	24.5	25.8	27.2
	-20	15.1	17.1	17.9	18.8	19.7	17.4	19.7	20.7	21.7	22.8	18.2	20.7	21.7	22.8	24.0	18.8	21.4	22.5	23.6	24.9	20.4	23.3	24.5	25.8	27.2
	-15	15.2	17.1	17.9	18.8	19.7	17.4	19.7	20.7	21.7	22.8	18.2	20.7	21.7	22.8	24.0	18.8	21.4	22.5	23.6	24.9	20.4	23.3	24.5	25.8	27.2
	-10	14.9	16.8	17.6	18.4	19.3	17.1	19.4	20.3	21.3	22.4	17.9	20.4	21.3	22.4											



## LANDING GROSS CLIMB GRADIENT - PERCENT

## FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		10000					9500					9000					8500					8000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
0	-35	22.2	25.8	27.3	28.9	30.8	24.1	28.2	29.9	31.8	33.9	26.3	30.9	32.8	35.0	37.5	28.9	34.1	36.3	38.8	41.7	31.9	37.9	40.5	43.4	46.8
	-30	22.2	25.8	27.2	28.9	30.7	24.2	28.2	29.8	31.7	33.8	26.4	30.9	32.8	34.9	37.3	28.9	34.1	36.3	38.7	41.5	31.9	37.9	40.4	43.3	46.6
	-25	22.2	25.8	27.2	28.9	30.7	24.2	28.2	29.8	31.7	33.7	26.4	30.9	32.8	34.9	37.3	29.0	34.1	36.2	38.7	41.5	31.9	37.9	40.4	43.2	46.5
	-20	22.3	25.8	27.2	28.8	30.6	24.2	28.2	29.8	31.6	33.7	26.5	30.9	32.8	34.9	37.2	29.0	34.1	36.2	38.6	41.4	32.0	37.9	40.4	43.2	46.4
	-15	22.3	25.8	27.2	28.8	30.6	24.3	28.2	29.8	31.6	33.7	26.5	31.0	32.8	34.8	37.2	29.1	34.1	36.2	38.6	41.3	32.1	37.9	40.4	43.2	46.4
	-10	22.4	25.8	27.2	28.8	30.6	24.3	28.2	29.8	31.6	33.6	26.6	31.0	32.8	34.8	37.1	29.2	34.2	36.3	38.6	41.3	32.2	38.0	40.4	43.1	46.3
	-5	22.4	25.9	27.3	28.8	30.6	24.4	28.3	29.8	31.6	33.6	26.6	31.0	32.8	34.8	37.1	29.2	34.2	36.3	38.6	41.2	32.2	38.0	40.4	43.1	46.3
	0	22.1	25.5	26.9	28.4	30.1	24.1	27.9	29.4	31.1	33.1	26.3	30.6	32.3	34.3	36.5	28.9	33.7	35.8	38.0	40.6	31.8	37.5	39.8	42.5	45.5
	5	21.8	25.1	26.5	27.9	29.6	23.8	27.5	29.0	30.7	32.5	26.0	30.2	31.9	33.8	35.9	28.5	33.3	35.2	37.4	39.9	31.5	37.0	39.2	41.8	44.8
	10	19.4	22.3	23.4	24.7	26.2	21.2	24.4	25.8	27.2	28.9	23.2	26.9	28.4	30.1	31.9	25.5	29.7	31.5	33.4	35.6	28.2	33.1	35.1	37.3	39.9
1	-35	21.9	25.4	26.9	28.5	30.3	23.9	27.8	29.5	31.3	33.3	26.1	30.5	32.4	34.5	36.8	28.6	33.7	35.8	38.2	40.9	31.5	37.4	39.9	42.7	45.9
	-30	21.9	25.4	26.8	28.4	30.2	23.9	27.8	29.4	31.2	33.2	26.1	30.5	32.3	34.4	36.7	28.6	33.6	35.7	38.1	40.8	31.6	37.4	39.8	42.6	45.8
	-25	22.0	25.4	26.8	28.4	30.2	23.9	27.8	29.4	31.2	33.2	26.1	30.5	32.3	34.3	36.6	28.7	33.6	35.7	38.0	40.7	31.6	37.4	39.8	42.5	45.7
	-20	22.0	25.4	26.8	28.4	30.1	24.0	27.8	29.4	31.1	33.1	26.2	30.5	32.3	34.3	36.6	28.7	33.6	35.7	38.0	40.6	31.7	37.4	39.8	42.5	45.6
	-15	22.1	25.5	26.8	28.4	30.1	24.0	27.8	29.4	31.1	33.1	26.2	30.6	32.3	34.3	36.6	28.8	33.7	35.7	38.0	40.6	31.7	37.4	39.8	42.5	45.5
	-10	22.1	25.5	26.9	28.4	30.1	24.1	27.9	29.4	31.1	33.1	26.3	30.6	32.3	34.3	36.5	28.9	33.7	35.7	38.0	40.6	31.8	37.5	39.8	42.5	45.5
	-5	22.0	25.4	26.7	28.2	29.9	24.0	27.7	29.2	30.9	32.8	26.2	30.4	32.2	34.1	36.3	28.7	33.5	35.5	37.8	40.3	31.7	37.3	39.6	42.2	45.2
	0	21.7	25.0	26.3	27.7	29.3	23.7	27.3	28.8	30.4	32.3	25.9	30.0	31.6	33.5	35.6	28.4	33.0	35.0	37.1	39.6	31.3	36.7	38.9	41.5	44.4
	5	20.6	23.6	24.8	26.2	27.7	22.4	25.8	27.2	28.7	30.5	24.5	28.4	30.0	31.7	33.7	26.9	31.3	33.1	35.1	37.4	29.7	34.8	36.9	39.3	42.0
	10	18.2	20.9	21.9	23.1	24.4	19.9	22.9	24.1	25.5	27.0	21.9	25.3	26.6	28.2	29.9	24.1	27.9	29.5	31.3	33.3	26.6	31.1	32.9	35.0	37.3
2	-35	21.8	25.3	26.6	28.2	30.0	23.8	27.6	29.2	31.0	33.0	26.0	30.3	32.1	34.1	36.4	28.4	33.4	35.5	37.8	40.4	31.4	37.1	39.5	42.2	45.4
	-30	21.8	25.2	26.6	28.2	29.9	23.8	27.6	29.2	30.9	32.9	26.0	30.3	32.1	34.1	36.3	28.5	33.4	35.4	37.7	40.3	31.4	37.1	39.4	42.1	45.2
	-25	21.9	25.2	26.6	28.1	29.8	23.8	27.6	29.1	30.9	32.8	26.0	30.3	32.0	34.0	36.2	28.5	33.4	35.4	37.6	40.2	31.4	37.0	39.4	42.0	45.1
	-20	21.9	25.2	26.6	28.1	29.8	23.8	27.6	29.1	30.8	32.8	26.1	30.3	32.0	34.0	36.2	28.6	33.4	35.4	37.6	40.2	31.5	37.1	39.4	42.0	45.0
	-15	22.0	25.3	26.6	28.1	29.8	23.9	27.6	29.1	30.8	32.7	26.1	30.3	32.0	34.0	36.1	28.6	33.4	35.4	37.6	40.1	31.6	37.1	39.4	42.0	45.0
	-10	22.0	25.3	26.6	28.1	29.7	24.0	27.7	29.2	30.8	32.7	26.2	30.4	32.1	34.0	36.1	28.7	33.5	35.4	37.6	40.1	31.7	37.1	39.4	42.0	44.9
	-5	21.7	24.9	26.2	27.7	29.3	23.7	27.3	28.8	30.4	32.2	25.9	30.0	31.6	33.5	35.6	28.4	33.0	34.9	37.1	39.5	31.3	36.7	38.9	41.4	44.3
	0	21.4	24.5	25.8	27.1	28.7	23.3	26.8	28.2	29.8	31.6	25.5	29.4	31.0	32.9	34.9	27.9	32.4	34.3	36.4	38.7	30.8	36.0	38.2	40.6	43.4
	5	19.3	22.1	23.2	24.5	25.8	21.1	24.2	25.5	26.9	28.5	23.1	26.7	28.1	29.7	31.5	25.4	29.5	31.1	33.0	35.0	28.1	32.8	34.7	36.8	39.3
	10	17.0	19.5	20.4	21.5	22.7	18.7	21.4	22.5	23.8	25.1	20.6	23.7	24.9	26.3	27.9	22.7	26.2	27.7	29.3	31.1	25.1	29.2	30.9	32.8	34.9
3	-35	22.0	25.3	26.7	28.3	30.0	23.9	27.7	29.3	31.0	33.0	26.1	30.4	32.2	34.2	36.4	28.6	33.5	35.5	37.8	40.4	31.5	37.2	39.5	42.2	45.3
	-30	22.0	25.3	26.7	28.2	29.9	23.9	27.7	29.2	31.0	32.9	26.1	30.4	32.1	34.1	36.3	28.6	33.5	35.5	37.8	40.3	31.6	37.2	39.5	42.1	45.2
	-25	22.0	25.3	26.7	28.2	29.8	24.0	27.7	29.2	30.9	32.8	26.2	30.4	32.1	34.0	36.2	28.7	33.5	35.5	37.7	40.2	31.6	37.1	39.4	42.1	45.0
	-20	22.0	25.3	26.7	28.2	29.8	24.0	27.7	29.2	30.9	32.8	26.2	30.4	32.1	34.0	36.2	28.7	33.5	35.5	37.7	40.2	31.7	37.2	39.4	42.0	45.0
	-15	22.1	25.4	26.7	28.1	29.8	24.1	27.7	29.2	30.9	32.7	26.3	30.4	32.1	34.0	36.1	28.8	33.5	35.5	37.6	40.1	31.7	37.2	39.4	42.0	44.9
	-10	22.0	25.3	26.6	28.1	29.6	24.0	27.6	29.1	30.7	32.6	26.2	30.3	32.0	33.8	35.9	28.7	33.4	35.3	37.5	39.9	31.7	37.0	39.3	41.8	44.6
	-5	21.5	24.7	25.9	27.3	28.9	23.5	27.0	28.4	30.0	31.7	25.6	29.6	31.2	33.0	35.0	28.1	32.6	34.5	36.6	38.9	31.0	36.2	38.4	40.8	43.5
	0	20.6	23.6	24.8	26.1	27.6	22.5	25.8	27.2	28.7	30.3	24.6	28.4	29.9	31.6	33.5	27.0	31.3	33.1	35.0	37.2	29.8	34.8	36.8	39.1	41.7
	5	18.1	20.6	21.7	22.8	24.0	19.8	22.7	23.8	25.1	26.5	21.7	25.0	26.3	27.8	29.4	23.9	27.6	29.1	30.8	32.7	26.4	30.7	32.5	34.5	36.7
	10	15.9	18.1	19.0	20.0	21.1	17.5	20.0	21.0	22.1	23.4	19.3	22.1	23.3	24.6	26.0	21.3	24.6	25.9	27.4	29.0	23.6	27.4	28.9	30.7	32.6
4	-35	22.1	25.4	26.8	28.3	30.0	24.0	27.8	29.3	31.0	33.0	26.3	30.5	32.2	34.2	36.4	28.8	33.6	35.6	37.8	40.4	31.7	37.2	39.6	42.2	45.2
	-30	22.1	25.4	26.8	28.2	29.9	24.1	27.8	29.3	31.0	32.9	26.3	30.5	32.2	34.1	36.3	28.8	33.6	35.5	37.8	40.3	31.7	37.2	39.5	42.1	45.1
	-25	22.1	25.4	26.7	28.2	29.8	24.1	27.8	29.3	30.9	32.8	26.3	30.5	32.2	34.1	36.2	28.8	33.6	35.5	37.7	40.2	31.7	37.2	39.5	42.0	44.9
	-20	22.2	25.4	26.7	28.2	29.8	24.1	27.8	29.3	30.9	32.8	26.3	30.5	32.2	34.0	36.1	28.9	33.6	35.5	37.7	40.1	31.8	37.2	39.5	42.0	44.9
	-15	22.2	25.4	26.7	28.2	29.8	24.2	27.8	29.3	30.9	32.7	26.4	30.5	32.2	34.0	36.1	28.9	33.6	35.5	37.6	40.0	31.8	37.2	39.4	41.9	44.8
	-10	21.9	25.0	26.3	27.7	29.2	23.8	27.3	28.8	30.3	32.1	26.0	30.0	31.6	33.4	35.4	28.5									



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																									
		*12375					11500					11200					11000					10500					
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	
6 0 0 0 0 0 0 0 0 0	-35	15.3	17.3	18.1	19.0	19.9	17.6	20.0	20.9	21.9	23.1	18.4	21.0	22.0	23.1	24.3	19.0	21.7	22.7	23.9	25.1	20.6	23.6	24.7	26.0	27.5	
	-30	15.3	17.3	18.1	18.9	19.9	17.6	19.9	20.9	21.9	23.0	18.4	20.9	21.9	23.0	24.2	19.0	21.6	22.7	23.8	25.1	20.6	23.5	24.7	26.0	27.4	
	-25	15.4	17.3	18.1	18.9	19.8	17.6	19.9	20.8	21.9	23.0	18.4	20.9	21.9	23.0	24.2	19.0	21.6	22.7	23.8	25.0	20.7	23.5	24.7	25.9	27.3	
	-20	15.4	17.3	18.1	18.9	19.8	17.6	19.9	20.8	21.8	22.9	18.5	20.9	21.9	23.0	24.1	19.1	21.6	22.6	23.8	25.0	20.7	23.5	24.7	25.9	27.3	
	-15	15.1	17.0	17.7	18.5	19.4	17.3	19.6	20.5	21.4	22.5	18.2	20.6	21.5	22.6	23.7	18.8	21.3	22.3	23.3	24.5	20.4	23.1	24.2	25.5	26.8	
	-10	14.4	16.2	16.9	17.6	18.5	16.6	18.7	19.5	20.4	21.4	22.4	17.4	19.7	20.5	21.5	22.6	18.0	20.3	21.3	22.3	23.4	19.5	22.1	23.2	24.3	25.6
	-5	13.1	14.7	15.4	16.0	16.8	15.2	17.1	17.9	18.7	19.6	16.0	18.0	18.8	19.7	20.7	16.5	18.7	19.5	20.4	21.4	18.0	20.4	21.3	22.4	23.5	
	0	11.0	12.4	12.9	13.4	14.0	12.9	14.5	15.2	15.9	16.6	13.6	15.4	16.0	16.8	17.6	14.1	16.0	16.7	17.4	18.3	15.5	17.5	18.3	19.2	20.2	
	5	9.2	10.3	10.8	11.2	11.7	11.0	12.3	12.9	13.4	14.1	11.6	13.1	13.7	14.3	15.0	12.1	13.6	14.2	14.9	15.6	13.3	15.1	15.8	16.5	17.3	
	10	7.7	8.6	9.0	9.3	9.7	9.3	10.5	10.9	11.4	11.9	9.9	11.2	11.7	12.2	12.8	10.4	11.7	12.2	12.7	13.3	11.5	13.0	13.6	14.2	14.9	
7 0 0 0 0 0 0 0 0 0	-35	15.3	17.3	18.0	18.9	19.8	17.6	19.9	20.8	21.8	22.9	18.4	20.9	21.9	22.9	24.1	19.0	21.6	22.6	23.7	25.0	20.6	23.5	24.6	25.9	27.3	
	-30	15.3	17.2	18.0	18.8	19.7	17.5	19.8	20.7	21.7	22.8	18.4	20.8	21.8	22.8	24.0	19.0	21.5	22.5	23.6	24.9	20.6	23.4	24.5	25.8	27.1	
	-25	15.2	17.1	17.8	18.6	19.5	17.4	19.7	20.6	21.6	22.6	18.3	20.7	21.6	22.7	23.8	18.9	21.4	22.4	23.5	24.7	20.5	23.3	24.4	25.6	26.9	
	-20	15.1	17.0	17.7	18.5	19.4	17.3	19.6	20.4	21.4	22.4	18.2	20.6	21.5	22.5	23.6	18.8	21.2	22.2	23.3	24.5	20.4	23.1	24.2	25.4	26.7	
	-15	14.6	16.4	17.1	17.8	18.7	16.8	18.9	19.8	20.7	21.7	17.6	19.9	20.8	21.8	22.8	18.2	20.6	21.5	22.5	23.6	19.7	22.4	23.4	24.6	25.8	
	-10	14.0	15.7	16.3	17.0	17.8	16.1	18.1	18.9	19.8	20.7	21.7	16.9	19.1	19.9	20.8	21.8	17.5	19.7	20.6	21.6	22.6	19.0	21.5	22.5	23.6	24.8
	-5	12.1	13.6	14.1	14.7	15.4	14.1	15.9	16.5	17.3	18.1	14.9	16.7	17.5	18.3	19.1	15.4	17.3	18.1	18.9	19.9	16.8	19.0	19.8	20.8	21.8	
	0	10.1	11.3	11.7	12.2	12.8	11.9	13.3	13.9	14.5	15.2	12.6	14.1	14.8	15.4	16.2	13.1	14.7	15.3	16.0	16.8	14.4	16.2	16.9	17.7	18.6	
	5	8.4	9.4	9.7	10.2	10.6	10.1	11.3	11.8	12.3	12.8	10.7	12.0	12.5	13.1	13.7	11.2	12.5	13.1	13.7	14.3	12.3	13.9	14.5	15.2	15.9	
	10	6.9	7.7	8.0	8.3	8.7	8.5	9.5	9.9	10.3	10.8	9.1	10.2	10.6	11.1	11.6	9.5	10.7	11.1	11.6	12.1	10.6	11.9	12.4	13.0	13.6	
8 0 0 0 0 0 0 0 0 0	-35	14.5	16.3	17.0	17.8	18.7	16.7	18.9	19.7	20.7	21.7	17.5	19.9	20.8	21.8	22.9	18.1	20.5	21.5	22.5	23.7	19.7	22.4	23.4	24.6	25.9	
	-30	14.5	16.3	17.0	17.7	18.6	16.7	18.8	19.6	20.6	21.6	17.5	19.8	20.7	21.7	22.7	18.1	20.5	21.4	22.4	23.6	19.6	22.3	23.3	24.5	25.8	
	-25	14.4	16.2	16.9	17.6	18.4	16.6	18.7	19.5	20.5	21.4	17.4	19.7	20.6	21.5	22.6	18.0	20.4	21.3	22.3	23.4	19.6	22.2	23.2	24.3	25.6	
	-20	14.2	15.9	16.6	17.3	18.1	16.4	18.5	19.3	20.2	21.1	17.2	19.4	20.3	21.2	22.3	17.8	20.1	21.0	22.0	23.1	19.3	21.9	22.9	24.0	25.2	
	-15	13.4	15.0	15.6	16.2	17.0	15.5	17.4	18.1	19.0	19.8	16.2	18.3	19.1	20.0	20.9	16.8	18.9	19.8	20.7	21.7	18.3	20.7	21.6	22.6	23.8	
	-10	12.3	13.8	14.3	14.9	15.6	14.3	16.1	16.8	17.5	18.3	15.1	17.0	17.7	18.5	19.4	15.6	17.6	18.3	19.2	20.1	17.0	19.2	20.1	21.0	22.1	
	-5	10.4	11.6	12.1	12.6	13.1	12.3	13.7	14.3	15.0	15.6	13.0	14.5	15.2	15.8	16.6	13.4	15.1	15.8	16.5	17.3	14.7	16.6	17.4	18.2	19.1	
	0	8.5	9.5	9.9	10.3	10.8	10.2	11.5	11.9	12.5	13.0	10.9	12.2	12.7	13.3	13.9	11.3	12.7	13.3	13.9	14.5	12.5	14.1	14.7	15.4	16.1	
	5	7.0	7.8	8.1	8.4	8.8	8.6	9.6	10.0	10.4	10.9	9.2	10.3	10.7	11.2	11.7	9.6	10.8	11.2	11.7	12.3	10.7	12.0	12.6	13.1	13.8	
	10	5.6	6.3	6.5	6.8	7.1	7.1	7.9	8.3	8.6	9.0	7.7	8.6	8.9	9.3	9.7	8.1	9.0	9.4	9.8	10.3	9.1	10.2	10.6	11.1	11.6	
9 0 0 0 0 0 0 0 0 0	-35	12.2	13.7	14.3	15.0	15.7	14.3	16.1	16.8	17.6	18.4	15.0	17.0	17.7	18.6	19.5	15.6	17.6	18.4	19.3	20.2	17.0	19.2	20.1	21.1	22.2	
	-30	12.0	13.4	14.0	14.6	15.3	14.0	15.7	16.4	17.2	18.0	14.7	16.6	17.3	18.1	19.0	15.3	17.2	18.0	18.8	19.8	16.6	18.8	19.7	20.7	21.7	
	-25	11.7	13.1	13.6	14.2	14.9	13.7	15.4	16.0	16.8	17.6	14.4	16.2	16.9	17.7	18.6	14.9	16.8	17.6	18.4	19.3	16.3	18.4	19.3	20.2	21.2	
	-20	10.8	12.1	12.6	13.1	13.7	12.7	14.3	14.9	15.5	16.3	13.4	15.1	15.7	16.5	17.2	13.9	15.7	16.3	17.1	17.9	15.2	17.2	18.0	18.8	19.7	
	-15	9.4	10.5	10.9	11.4	11.9	11.2	12.6	13.1	13.7	14.3	11.9	13.4	13.9	14.6	15.2	12.4	13.9	14.5	15.2	15.9	13.6	15.4	16.0	16.8	17.6	
	-10	8.0	8.9	9.3	9.7	10.1	9.7	10.9	11.3	11.8	12.3	10.3	11.6	12.1	12.6	13.2	10.8	12.1	12.6	13.2	13.8	11.9	13.4	14.0	14.7	15.4	
	-5	6.5	7.3	7.6	7.9	8.2	8.1	9.1	9.5	9.9	10.3	8.7	9.7	10.2	10.6	11.1	9.1	10.2	10.6	11.1	11.6	10.2	11.5	12.0	12.5	13.1	
	0	5.2	5.7	6.0	6.2	6.5	6.6	7.4	7.7	8.1	8.4	7.2	8.0	8.4	8.7	9.1	7.6	8.5	8.8	9.2	9.6	8.6	9.6	10.0	10.5	11.0	
	5	3.9	4.3	4.5	4.7	4.9	5.3	5.9	6.1	6.4	6.7	5.8	6.5	6.7	7.0	7.3	6.2	6.9	7.2	7.5	7.8	7.1	8.0	8.3	8.7	9.1	
	10	2.8	3.1	3.2	3.3	3.5	4.1	4.5	4.7	4.9	5.1	4.5	5.1	5.3	5.5	5.7	4.9	5.5	5.7	5.9	6.2	5.8	6.5	6.7	7.0	7.3	
1 0 0 0 0 0 0 0 0 0	-35	11.5	12.9	13.5	14.0	14.7	13.5	15.2	15.9	16.6	17.4	14.3	16.1	16.8	17.6	18.4	14.8	16.7	17.4	18.2	19.1	16.2	18.3	19.1	20.0	21.0	
	-30	11.1	12.5	13.0	13.5	14.1	13.1	14.7	15.3	16.0	16.8	13.9	15.6	16.3	17.0	17.8	14.4	16.2	16.9	17.6	18.5	15.7	17.7	18.5	19.4	20.4	
	-25	10.8	12.0	12.5	13.0	13.6	12.7	14.2	14.8	15.5	16.2	13.4	15.1	15.7	16.4	17.2	13.9	15.7	16.3	17.1	17.9	15.2	17.2	18.0	18.8	19.7	
	-20	9.2	10.2	10.6	11.1	11.6	11.0	12.3	12.8	13.4	14.0	11.7	13.1	13.6	14.2	14.9	12.1	13.6	14.2	14.8	15.5	13.4	15.0	15.7	16.4	17.2	
	-15	7.6	8.4	8.7	9.1	9.5	9.2	10.3	10.7	11.2	11.7	9.9	11.0	11.5	12.0	12.6	10.3	11.5	12.0	12.6	13.1	11.4	12.9	13.4	14.0	14.7	
	-10	6.0	6.7	6.9	7.2	7.5	7.5	8.4	8.8	9.1	9.5	8.1	9.1	9.5	9.9	10.3	8.5										



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																								
		10000					9500					9000					8500					8000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
6000	-35	22.4	25.7	27.0	28.5	30.1	24.4	28.1	29.5	31.2	33.0	26.6	30.8	32.5	34.3	36.5	29.2	33.9	35.8	38.0	40.4	32.1	37.6	39.8	42.4	45.2
	-30	22.4	25.6	26.9	28.4	30.0	24.4	28.0	29.5	31.1	32.9	26.6	30.7	32.4	34.3	36.3	29.2	33.8	35.8	37.9	40.3	32.1	37.5	39.7	42.2	45.1
	-25	22.4	25.6	26.9	28.4	29.9	24.4	28.0	29.5	31.1	32.9	26.7	30.7	32.4	34.2	36.3	29.2	33.8	35.7	37.8	40.2	32.2	37.5	39.7	42.2	45.0
	-20	22.5	25.6	26.9	28.3	29.9	24.4	28.0	29.5	31.1	32.8	26.7	30.7	32.4	34.2	36.2	29.3	33.8	35.7	37.8	40.2	32.2	37.5	39.7	42.1	44.9
	-15	22.1	25.2	26.5	27.8	29.4	24.1	27.6	29.0	30.5	32.3	26.3	30.3	31.8	33.6	35.6	28.9	33.3	35.2	37.2	39.5	31.8	36.9	39.1	41.4	44.1
	-10	21.2	24.2	25.3	26.6	28.1	23.1	26.4	27.8	29.2	30.8	25.3	29.0	30.5	32.2	34.1	27.7	32.0	33.7	35.6	37.8	30.6	35.5	37.5	39.7	42.2
	-5	19.6	22.3	23.4	24.5	25.8	21.4	24.4	25.6	27.0	28.4	23.5	26.9	28.2	29.8	31.4	25.8	29.7	31.2	33.0	34.9	28.4	32.9	34.7	36.8	39.1
	0	17.0	19.3	20.2	21.2	22.3	18.6	21.2	22.2	23.4	24.6	20.5	23.4	24.6	25.9	27.3	22.6	25.9	27.3	28.7	30.4	25.0	28.8	30.4	32.1	34.1
	5	14.7	16.7	17.4	18.3	19.2	16.2	18.4	19.3	20.3	21.4	17.9	20.5	21.5	22.6	23.8	19.8	22.7	23.9	25.2	26.6	22.1	25.4	26.7	28.2	29.9
	10	12.8	14.5	15.1	15.9	16.7	14.2	16.1	16.9	17.7	18.6	15.8	18.0	18.9	19.8	20.9	17.6	20.1	21.1	22.2	23.5	19.6	22.5	23.7	25.0	26.5
7000	-35	22.4	25.6	26.9	28.3	29.9	24.4	28.0	29.4	31.0	32.8	26.6	30.7	32.3	34.1	36.2	29.1	33.8	35.7	37.8	40.1	32.1	37.4	39.6	42.1	44.9
	-30	22.3	25.5	26.8	28.2	29.7	24.3	27.9	29.3	30.9	32.6	26.5	30.6	32.2	34.0	36.0	29.1	33.7	35.5	37.6	39.9	32.0	37.3	39.5	41.9	44.6
	-25	22.2	25.3	26.6	28.0	29.5	24.2	27.7	29.1	30.7	32.4	26.4	30.4	32.0	33.7	35.7	29.0	33.5	35.3	37.3	39.6	31.9	37.1	39.2	41.6	44.3
	-20	22.1	25.2	26.4	27.8	29.3	24.1	27.5	28.9	30.4	32.1	26.3	30.2	31.8	33.5	35.5	28.8	33.3	35.1	37.1	39.3	31.7	36.9	38.9	41.3	43.9
	-15	21.5	24.4	25.6	26.9	28.3	23.4	26.7	28.0	29.5	31.1	25.6	29.3	30.8	32.5	34.3	28.0	32.3	34.0	35.9	38.1	30.9	35.8	37.8	40.0	42.6
	-10	20.7	23.5	24.6	25.8	27.2	22.5	25.7	27.0	28.3	29.9	24.7	28.2	29.6	31.2	33.0	27.1	31.1	32.7	34.6	36.6	29.8	34.5	36.4	38.5	40.9
	-5	18.3	20.8	21.8	22.8	24.0	20.1	22.8	23.9	25.1	26.5	22.0	25.1	26.4	27.8	29.3	24.2	27.8	29.2	30.8	32.6	26.8	30.9	32.5	34.4	36.5
	0	15.8	17.9	18.7	19.6	20.6	17.4	19.7	20.6	21.7	22.8	19.1	21.8	22.9	24.1	25.4	21.1	24.2	25.4	26.8	28.3	23.4	27.0	28.4	30.0	31.8
	5	13.7	15.4	16.1	16.9	17.7	15.1	17.1	17.9	18.8	19.8	16.8	19.1	20.0	21.0	22.1	18.6	21.2	22.3	23.5	24.8	20.7	23.8	25.0	26.4	27.9
	10	11.8	13.3	13.9	14.6	15.3	13.2	14.9	15.6	16.4	17.2	14.7	16.7	17.5	18.4	19.3	16.4	18.7	19.6	20.6	21.8	18.4	21.0	22.1	23.3	24.6
8000	-35	21.4	24.4	25.6	26.9	28.4	23.3	26.7	28.0	29.5	31.2	25.5	29.3	30.8	32.5	34.5	28.0	32.3	34.1	36.0	38.2	30.8	35.8	37.9	40.1	42.7
	-30	21.3	24.3	25.5	26.8	28.2	23.3	26.6	27.9	29.4	31.0	25.4	29.2	30.7	32.4	34.3	27.9	32.2	33.9	35.8	38.0	30.7	35.7	37.7	39.9	42.5
	-25	21.3	24.2	25.4	26.6	28.1	23.2	26.5	27.8	29.2	30.8	25.3	29.1	30.5	32.2	34.0	27.8	32.0	33.7	35.6	37.8	30.6	35.5	37.5	39.7	42.2
	-20	21.0	23.9	25.0	26.3	27.6	22.9	26.1	27.4	28.8	30.4	25.1	28.7	30.1	31.8	33.6	27.5	31.6	33.3	35.1	37.2	30.3	35.1	37.0	39.2	41.6
	-15	19.9	22.6	23.7	24.8	26.1	21.8	24.8	26.0	27.3	28.7	23.8	27.2	28.6	30.1	31.7	26.1	30.0	31.6	33.3	35.2	28.8	33.3	35.1	37.1	39.4
	-10	18.6	21.1	22.0	23.1	24.3	20.3	23.1	24.2	25.4	26.8	22.3	25.5	26.7	28.1	29.6	24.5	28.1	29.6	31.1	32.9	27.1	31.2	32.9	34.8	36.8
	-5	16.2	18.3	19.1	20.1	21.1	17.8	20.2	21.1	22.2	23.3	19.6	22.3	23.4	24.6	25.9	21.6	24.7	26.0	27.3	28.9	24.0	27.5	29.0	30.6	32.4
	0	13.9	15.6	16.3	17.1	18.0	15.3	17.4	18.2	19.0	20.0	17.0	19.3	20.2	21.2	22.3	18.8	21.5	22.5	23.7	25.0	21.0	24.0	25.3	26.6	28.2
	5	11.9	13.5	14.1	14.7	15.4	13.3	15.0	15.7	16.5	17.3	14.8	16.8	17.6	18.5	19.4	16.5	18.8	19.7	20.8	21.9	18.5	21.2	22.2	23.4	24.8
	10	10.2	11.5	12.0	12.6	13.2	11.5	13.0	13.6	14.2	14.9	12.9	14.6	15.3	16.1	16.9	14.5	16.5	17.3	18.2	19.1	16.3	18.7	19.6	20.6	21.8
9000	-35	18.5	21.1	22.1	23.2	24.4	20.3	23.1	24.3	25.5	26.9	22.2	25.5	26.8	28.2	29.8	24.5	28.1	29.6	31.3	33.1	27.0	31.2	33.0	34.9	37.1
	-30	18.2	20.7	21.6	22.7	23.9	19.9	22.7	23.8	25.0	26.4	21.8	25.0	26.2	27.6	29.2	24.0	27.6	29.0	30.6	32.4	26.5	30.7	32.3	34.2	36.3
	-25	17.8	20.2	21.2	22.2	23.3	19.5	22.2	23.3	24.5	25.8	21.4	24.5	25.7	27.0	28.5	23.6	27.1	28.5	30.0	31.7	26.1	30.1	31.7	33.5	35.5
	-20	16.7	18.9	19.8	20.7	21.8	18.3	20.8	21.8	22.9	24.1	20.2	23.0	24.1	25.4	26.7	22.2	25.5	26.8	28.2	29.8	24.6	28.3	29.8	31.5	33.4
	-15	15.0	17.0	17.7	18.6	19.5	16.5	18.8	19.6	20.6	21.7	18.3	20.8	21.8	22.9	24.1	20.2	23.1	24.2	25.5	26.9	22.4	25.8	27.1	28.6	30.3
	-10	13.2	14.9	15.6	16.3	17.1	14.7	16.6	17.4	18.2	19.1	16.3	18.5	19.3	20.3	21.4	18.1	20.6	21.6	22.7	24.0	20.1	23.1	24.3	25.6	27.0
	-5	11.4	12.8	13.4	14.0	14.7	12.7	14.4	15.0	15.8	16.6	14.2	16.1	16.9	17.7	18.6	15.9	18.1	19.0	19.9	21.0	17.8	20.4	21.4	22.5	23.8
	0	9.7	10.9	11.4	11.9	12.5	10.9	12.3	12.9	13.5	14.2	12.3	14.0	14.6	15.3	16.1	13.9	15.8	16.5	17.4	18.3	15.7	17.9	18.8	19.8	20.8
	5	8.1	9.2	9.6	10.0	10.5	9.3	10.5	11.0	11.5	12.0	10.6	12.0	12.5	13.1	13.8	12.0	13.7	14.3	15.0	15.8	13.7	15.6	16.4	17.2	18.2
	10	6.7	7.6	7.9	8.3	8.6	7.8	8.8	9.2	9.6	10.1	9.0	10.2	10.7	11.2	11.7	10.4	11.8	12.3	12.9	13.6	11.9	13.6	14.3	15.0	15.8
10000	-35	17.7	20.1	21.0	22.0	23.2	19.4	22.0	23.1	24.3	25.6	21.3	24.3	25.5	26.8	28.3	23.4	26.8	28.2	29.8	31.5	25.9	29.8	31.4	33.2	35.3
	-30	17.2	19.5	20.4	21.4	22.4	18.9	21.4	22.4	23.6	24.8	20.7	23.6	24.8	26.1	27.5	22.8	26.1	27.5	28.9	30.6	25.2	29.1	30.6	32.3	34.3
	-25	16.7	18.9	19.8	20.7	21.8	18.3	20.8	21.8	22.9	24.1	20.2	23.0	24.1	25.3	26.7	22.2	25.4	26.7	28.1	29.7	24.6	28.3	29.8	31.4	33.3
	-20	14.7	16.6	17.4	18.2	19.1	16.2	18.4	19.3	20.2	21.2	17.9	20.4	21.4	22.4	23.6	19.9	22.7	23.8	25.0	26.4	22.1	25.3	26.6	28.1	29.7
	-15	12.7	14.3	15.0	15.7	16.4	14.1	16.0	16.7	17.5	18.4	15.7	17.8	18.6	19.5	20.6	17.4	19.9	20.8	21.9	23.1	19.5	22.3	23.4	24.7	26.1
	-10	10.8	12.1	12.6	13.2	13.8	12.0	13.6	14.2	14.9	15.6	13.5	15.3	16.0	16.8	17.6	15.									



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	WEIGHT - POUNDS																			
		*12375					11500					11200					11000				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	9.0	10.0	10.4	10.9	11.3	10.8	12.1	12.6	13.1	13.7	11.5	12.8	13.4	14.0	14.6	11.9	13.4	14.0	14.6	15.2
2	-30	8.6	9.6	10.0	10.4	10.8	10.4	11.6	12.0	12.6	13.1	11.0	12.3	12.8	13.4	14.0	11.5	12.9	13.4	14.0	14.6
0	-25	7.7	8.5	8.8	9.2	9.6	9.3	10.4	10.8	11.3	11.8	10.0	11.1	11.6	12.1	12.6	10.4	11.7	12.1	12.7	13.2
0	-20	6.5	7.3	7.5	7.8	8.2	8.1	9.1	9.4	9.8	10.2	8.7	9.7	10.1	10.6	11.0	9.1	10.2	10.6	11.1	11.6
0	-15	5.1	5.7	5.9	6.1	6.4	6.6	7.3	7.6	7.9	8.3	7.1	8.0	8.3	8.6	9.0	7.5	8.4	8.7	9.1	9.5
0	-10	3.8	4.2	4.3	4.5	4.7	5.1	5.7	5.9	6.2	6.4	5.7	6.3	6.5	6.8	7.1	6.0	6.7	7.0	7.3	7.6
0	-5	2.6	2.8	2.9	3.1	3.2	3.8	4.3	4.4	4.6	4.8	4.3	4.8	5.0	5.2	5.4	4.7	5.2	5.4	5.6	5.9
0	0	1.5	1.6	1.7	1.8	1.8	2.7	3.0	3.1	3.2	3.3	3.1	3.5	3.6	3.8	3.9	3.4	3.8	4.0	4.1	4.3
0	5	.5	.5	.6	.6	.6	1.6	1.8	1.9	1.9	2.0	2.0	2.3	2.3	2.4	2.5	2.3	2.6	2.7	2.8	2.9
0	10	-.5	-.5	-.5	-.6	-.6	.6	.6	.7	.7	.7	1.0	1.1	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.6
1	-35	8.1	9.0	9.3	9.7	10.1	9.8	10.9	11.4	11.9	12.4	10.4	11.7	12.2	12.7	13.2	10.9	12.2	12.7	13.2	13.8
3	-30	7.6	8.5	8.8	9.1	9.5	9.3	10.4	10.8	11.2	11.7	9.9	11.1	11.5	12.0	12.6	10.4	11.6	12.1	12.6	13.2
0	-25	6.7	7.5	7.7	8.0	8.4	8.3	9.3	9.6	10.0	10.5	8.9	10.0	10.4	10.8	11.3	9.4	10.4	10.9	11.3	11.8
0	-20	5.7	6.3	6.6	6.8	7.1	7.2	8.1	8.4	8.7	9.1	7.8	8.7	9.1	9.4	9.8	8.2	9.2	9.5	9.9	10.4
0	-15	4.2	4.6	4.8	5.0	5.2	5.6	6.2	6.4	6.7	7.0	6.1	6.8	7.1	7.4	7.7	6.5	7.2	7.5	7.8	8.2
0	-10	2.9	3.2	3.4	3.5	3.6	4.2	4.7	4.9	5.1	5.3	4.7	5.3	5.5	5.7	5.9	5.1	5.7	5.9	6.1	6.4
0	-5	1.8	2.0	2.1	2.1	2.2	3.0	3.3	3.5	3.6	3.8	3.5	3.9	4.0	4.2	4.3	3.8	4.2	4.4	4.6	4.8
0	0	.8	.8	.9	.9	.9	1.9	2.1	2.2	2.3	2.4	2.3	2.6	2.7	2.8	2.9	2.6	2.9	3.0	3.2	3.3
0	5	-.2	-.2	-.2	-.2	-.2	.9	1.0	1.0	1.1	1.1	1.3	1.4	1.5	1.5	1.6	1.6	1.7	1.8	1.9	2.0
0	10	-1.1	-1.2	-1.3	-1.3	-1.4	-.1	-.1	-.1	-.1	-.1	.3	.3	.3	.3	.3	.5	.6	.6	.6	.7
1	-35	7.2	8.0	8.3	8.6	9.0	8.8	9.9	10.2	10.7	11.1	9.5	10.6	11.0	11.4	11.9	9.9	11.1	11.5	12.0	12.5
4	-30	6.6	7.3	7.6	7.9	8.2	8.2	9.1	9.5	9.9	10.3	8.8	9.8	10.2	10.6	11.1	9.3	10.3	10.7	11.2	11.7
0	-25	5.9	6.5	6.7	7.0	7.3	7.4	8.2	8.5	8.9	9.3	8.0	8.9	9.2	9.6	10.0	8.4	9.3	9.7	10.1	10.5
0	-20	4.7	5.2	5.4	5.6	5.8	6.2	6.8	7.1	7.4	7.7	6.7	7.5	7.8	8.1	8.4	7.1	7.9	8.2	8.5	8.9
0	-15	3.4	3.7	3.8	4.0	4.1	4.7	5.2	5.4	5.6	5.8	5.2	5.8	6.0	6.2	6.5	5.6	6.2	6.4	6.7	7.0
0	-10	2.1	2.4	2.5	2.5	2.6	3.4	3.8	3.9	4.0	4.2	3.9	4.3	4.4	4.6	4.8	4.2	4.7	4.8	5.0	5.2
0	-5	1.1	1.2	1.2	1.3	1.3	2.2	2.5	2.5	2.6	2.8	2.7	2.9	3.1	3.2	3.3	3.0	3.3	3.4	3.6	3.7
0	0	.1	.1	.1	.1	.1	1.2	1.3	1.3	1.4	1.4	1.6	1.7	1.8	1.9	2.0	1.9	2.1	2.1	2.2	2.3
0	5	-.9	-.9	-1.0	-1.0	-1.0	.2	.2	.2	.2	.2	.6	.6	.6	.7	.7	.8	.9	.9	1.0	1.0
0	10	-1.7	-1.9	-1.9	-2.0	-2.1	-.7	-.8	-.8	-.9	-.9	-.4	-.4	-.4	-.4	-.5	-.1	-.1	-.1	-.1	-.1

\* FOR USE IN AN EMERGENCY WHICH REQUIRES A LANDING AT A WEIGHT IN EXCESS OF MAXIMUM  
DESIGN LANDING WEIGHT OF 11500 POUNDS.

Figure 4-51 (Sheet 5)



## LANDING GROSS CLIMB GRADIENT - PERCENT

FLAPS - LAND

CONDITIONS: ANTI-ICE SYSTEMS - ON  
LANDING GEAR - DOWN  
AIRSPEED - VREFSPEEDBRAKES - RETRACT  
ENGINES - TAKEOFF THRUST

ALT FT	TEMP DEG C	HEIGHT - POUNDS																			
		10000					9500					9000					8500				
		WIND KNOTS					WIND KNOTS					WIND KNOTS					WIND KNOTS				
		-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30	-10	0	10	20	30
1	-35	14.6	16.4	17.2	18.0	18.9	16.1	18.2	19.0	19.9	20.9	17.8	20.2	21.1	22.2	23.3	19.7	22.4	23.5	24.7	26.1
2	-30	14.1	15.9	16.6	17.3	18.2	15.6	17.6	18.4	19.3	20.2	17.2	19.5	20.4	21.4	22.5	19.1	21.7	22.8	23.9	25.2
0	-25	12.9	14.5	15.1	15.8	16.6	14.3	16.1	16.9	17.7	18.5	15.9	18.0	18.8	19.7	20.7	17.7	20.1	21.0	22.1	23.3
0	-20	11.5	12.9	13.5	14.1	14.7	12.8	14.5	15.1	15.8	16.6	14.3	16.2	16.9	17.7	18.6	16.0	18.1	19.0	19.9	21.0
0	-15	9.7	10.9	11.4	11.9	12.4	10.9	12.3	12.8	13.4	14.1	12.3	13.9	14.5	15.2	16.0	13.9	15.7	16.4	17.2	18.1
0	-10	8.0	9.0	9.4	9.8	10.2	9.2	10.3	10.8	11.2	11.8	10.5	11.8	12.3	12.9	13.5	11.9	13.4	14.1	14.7	15.5
0	-5	6.6	7.3	7.6	8.0	8.3	7.6	8.6	8.9	9.3	9.7	8.8	9.9	10.4	10.8	11.4	10.1	11.5	12.0	12.6	13.2
0	0	5.2	5.8	6.0	6.3	6.6	6.2	6.9	7.2	7.6	7.9	7.3	8.2	8.6	9.0	9.4	8.6	9.6	10.1	10.5	11.1
0	5	4.0	4.4	4.6	4.8	5.0	4.9	5.5	5.7	6.0	6.2	6.0	6.7	7.0	7.3	7.6	7.1	8.0	8.4	8.8	9.2
0	10	2.8	3.1	3.2	3.4	3.5	3.7	4.1	4.3	4.5	4.7	4.6	5.2	5.4	5.7	5.9	5.7	6.5	6.7	7.1	7.4
1	-35	13.4	15.1	15.8	16.5	17.3	14.9	16.8	17.6	18.4	19.3	16.5	18.7	19.6	20.5	21.6	18.3	20.8	21.8	22.9	24.1
3	-30	12.9	14.5	15.1	15.8	16.5	14.3	16.1	16.8	17.6	18.5	15.9	18.0	18.8	19.7	20.7	17.7	20.0	21.0	22.0	23.2
0	-25	11.7	13.2	13.7	14.4	15.0	13.1	14.8	15.4	16.1	16.9	14.6	16.5	17.2	18.1	19.0	16.3	18.5	19.3	20.3	21.3
0	-20	10.5	11.8	12.3	12.8	13.4	11.8	13.2	13.8	14.4	15.1	13.2	14.9	15.6	16.3	17.1	14.8	16.8	17.5	18.4	19.3
0	-15	8.6	9.6	10.0	10.4	10.9	9.8	11.0	11.4	11.9	12.5	11.1	12.5	13.0	13.6	14.3	12.5	14.2	14.8	15.5	16.3
0	-10	7.0	7.8	8.2	8.5	8.9	8.1	9.1	9.5	9.9	10.4	9.3	10.5	11.0	11.5	12.0	10.7	12.1	12.6	13.2	13.9
0	-5	5.6	6.3	6.5	6.8	7.1	6.6	7.4	7.7	8.1	8.4	7.8	8.7	9.1	9.5	10.0	9.0	10.2	10.6	11.1	11.7
0	0	4.3	4.8	5.0	5.2	5.4	5.3	5.9	6.1	6.4	6.7	6.3	7.1	7.4	7.7	8.1	7.5	8.5	8.8	9.2	9.7
0	5	3.2	3.5	3.7	3.8	4.0	4.1	4.5	4.7	4.9	5.1	5.0	5.7	5.9	6.2	6.4	6.2	6.9	7.2	7.6	7.9
0	10	2.0	2.2	2.3	2.4	2.5	2.9	3.2	3.3	3.5	3.6	3.8	4.2	4.4	4.6	4.8	4.8	5.4	5.7	5.9	6.2
1	-35	12.4	13.9	14.5	15.1	15.8	13.8	15.5	16.2	16.9	17.7	15.3	17.3	18.1	18.9	19.9	17.1	19.3	20.2	21.2	22.3
4	-30	11.6	13.0	13.6	14.2	14.8	13.0	14.6	15.3	16.0	16.7	14.5	16.4	17.1	17.9	18.8	16.2	18.3	19.2	20.1	21.1
0	-25	10.7	12.0	12.4	13.0	13.6	12.0	13.5	14.1	14.7	15.4	13.4	15.1	15.8	16.5	17.3	15.1	17.0	17.8	18.7	19.6
0	-20	9.3	10.3	10.8	11.2	11.7	10.5	11.8	12.3	12.8	13.4	11.9	13.3	13.9	14.6	15.3	13.4	15.1	15.8	16.5	17.3
0	-15	7.5	8.4	8.8	9.1	9.5	8.7	9.7	10.2	10.6	11.1	10.0	11.2	11.7	12.2	12.8	11.4	12.8	13.4	14.0	14.7
0	-10	6.0	6.7	7.0	7.3	7.6	7.1	8.0	8.3	8.6	9.0	8.3	9.3	9.7	10.1	10.6	9.6	10.8	11.3	11.8	12.3
0	-5	4.7	5.2	5.4	5.7	5.9	5.7	6.4	6.6	6.9	7.2	6.8	7.6	7.9	8.3	8.6	8.0	9.0	9.4	9.8	10.3
0	0	3.5	3.9	4.0	4.2	4.4	4.4	4.9	5.1	5.3	5.6	5.4	6.1	6.3	6.6	6.9	6.6	7.4	7.7	8.0	8.4
0	5	2.3	2.6	2.7	2.8	2.9	3.2	3.6	3.7	3.9	4.0	4.2	4.6	4.8	5.0	5.3	5.2	5.9	6.1	6.4	6.7
0	10	1.3	1.4	1.5	1.6	1.6	2.1	2.4	2.5	2.6	2.7	3.0	3.4	3.5	3.6	3.8	4.0	4.5	4.7	4.9	5.1

REF-01-03

Figure 4-51 (Sheet 6)



1964 O - 354-000

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1964 O - 354-000											
1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261	262	263	264
265	266	267	268	269	270	271	272	273	274	275	276
277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312
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